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The Working of an English Railway.

THE public of this country seem likely to have at least the opportunity of being stirred out of their general ignorance and indifference as to the great operations of railway working daily going on over the length and breadth of the land, by having information on the subject put within their reach in a readable and interesting form, from writers whose knowledge of the subject cannot be contested. Scarcely had Mr. Acworth's collected essays on "The Railways of England," which we noticed the other day, appeared in the form of a volume, than it was followed by a volume of a somewhat more technical but still essentially popular character, on the working of one particular railway treated more in detail.

This is the book, small in size, but containing much information very clearly arranged,* by Mr. Findlay, the manager of the London and North-Western Railway. Mr. Acworth's book aimed at giving a comparative sketch of the various leading railways of England, their special history and characteristics, with incidental insight into railway working. Mr. Findlay's book gives an account of the working of the railway territory of a single company; and as manager of what we believe to be the best managed railway in the world, he ought certainly to have sufficient data for treating the subject satisfactorily. That the book should be permeated by a conviction of the excellence of London and North-Western methods is of course to be expected, since even railway managers are mortal; but it may be conceded that where the author speaks highly of the way things are done by his company he is a great deal more likely to be right than wrong.

Mr. Findlay wisely does not trouble the reader much with those curious details about the early history of railways and the contrast between former anticipations and present results, which are by this time in the way of becoming rather a bore to the more sensible of the reading public; but some practical illustrations as to early railway construction, to be found in chapters devoted to special subjects, are of some interest. Among these are the diagrams of the road made with fish-bellied rails jointed on square stone blocks, laid at Loughborough in 1789, and that of the permanent way of the Liverpool and Manchester Railway in 1830 laid on stone blocks placed lozenge-wise, corner to corner; in each case with a chair pinned down on to the centre of the stone block. It is curious to note that the Sheffield Colliery tramroad of 1776, more than half-a-century earlier, shows the cross-sleeper system which has now approved itself as at once the simplest and most scientific manner of carrying the rail. Various other forms of rail, early and late, are shown in section, including Locke's double-headed rail with an equal flange top and bottom, which was intended to be reversible; a scheme frustrated by the discovery that the pressure of the chairs at the bearing-points indented the lower flange too much to allow of its being run on if reversed. A remarkable example of the wearing down of the upper flange of a rail after twenty years' use on a main line and five years on a siding is shown. On this subject of the wear of rails there is an interesting short paper and discussion in the last-issued number of the Transactions of the American Society of Civil Engineers, a body which the engineers of the old country will, we believe, admit to be well to the front in its theory and study of all engineering topics, even if America seems somewhat in the rear at present in actual railway working. The paper referred to, "On the Destruction of Rails by Excessive Weights," by Mr. J. T. Dodge, deals with what the writer of it calls, very expressively, the "flow of metal" in the rails under heavy weights. The most noteworthy point in this paper is that the writer's observations lead him to the conclusion that a much greater distortion or flow of the metal is caused by heavy weights at a low speed than at a high speed. He says "On the rails of a fast-speed tangent no lip is perceptible on either rail, but on like rails for slow speed the lip is clearly visible." He continues

> "On the rails of a fast-speed curve there is a heavy lip on the outside of the inner rail, and only a very slight one on the outside of the outer rail. On a slow-speed curve the lip on the outer rail is more marked, and on the inner rail a little less so than on the fast-speed curve."

This is not very clearly put, but we presume that the expressions "outside" and "inner" are both used in reference to the direction of the curve, and its inner and outer side: though under that supposition it is not very easy to see why the pressure should be heavier on the inner rail. One would naturally expect that, in going quickly round a curve, the heaviest pressure of the wheels would have been against the inner side of the outer rail, and we here record a query as to whether the passage is correctly printed. However, Mr. Dodge appears to have established to his own satisfaction that slow speeds distort the rails most, a conclusion which is rather startling at first, and reminds one of the popular notion so often met with, that a train will be safer "if it runs very quickly" over a weak viaduct. A member of the American Society, in the discussion, in fact thought it worth while to tackle this point, and to show that "there is no discrepancy in theory between the increased flow of rails under slow loads and the increased load on a bridge under a fast train." The effect of a load suddenly brought on a bridge is twice the force of the static load; but this tries the structure not so much by pressure on parts in compression as by sudden strain on parts in tension, and on the mechanical connexions of parts. "The distortion of [the substance of] a plastic body results more from the length of time during which the force is applied, than from the amount of force." So Mr. Johnson, of the American Society of Engineers, puts it, and he instances as an illustration the laying of a small weight upon wax, which gradually sinks into it. The point as brought forward at the American Society of Engineers is certainly a curious one, and seems to deserve further attention. Two of the practical deductions made from its consideration at the American meeting were that the rails should be originally rolled with a slope inwards so as to give the wheels a wider bearing on them in the first instance (this also was Mr. Johnson's suggestion in discussion); and, Mr. Dodge's own conclusion at the close of his paper, that "the tendency to increase the weight of rolling-stock has passed its proper limits, and we should call a halt."

This communication from America coming into our hands at the moment of looking over Mr. Findlay's book has led us into a digression therefrom on the rail subject. To return thereto, many of the order of "nervous travellers" on our railways may read, we hope with interest and gratification, the account in the same chapter of the systematic

* "The Working and Management of an English Railway." By George Findlay, Lieut.-Col. Engineer and Railway Volunteer Staff Corps; Associate Inst. C.E.; General Manager of the London and North-Western Railway. With numerous illustrations. London: Whitaker & Co. and G. Bell & Sons; 1889.

arrangement for inspection of the track, and will probably learn with surprise that every portion of the line of railway is inspected every day. The machinery for this vast and important daily inspection consists, at its lower stratum, of knots or "gangs" of four men, a foreman and three under him, each of which gangs has under its charge about two miles of double line railway, or about one man to every mile of single line. Every ten or twenty of these gangs are responsible to an inspector, who thus has charge of twenty to forty miles of railway. Seven or eight inspectors are under the control of a chief inspector responsible for 200 to 250 miles, and who has under him a small regiment of travelling workmen for all kinds of current repairs. All these men and the inspector are under the direction of a divisional engineer with a staff of surveyors, draughtsmen, and clerks, with offices and workshops at the most central portion of the district. Each such sub-section is a division, and there are eight such divisions on the London and North-Western Railway. The divisional engineers are responsible to two assistant engineers, and to the engineer in chief of the Company. And so a railway track of many hundreds of miles is kept in safe working order.

If this should be a satisfactory statement for the traveller, so should the chapter on "Management" generally, one of the first in the book, bring trust and confidence to the soul of the shareholder. For there he will read of the equally systematic arrangements for preventing his money being lavished. The Executive at head-quarters is daily inundated with suggestions for increased accommodation and other alterations involving expenditure; but these are not lightly accepted:—

"We will suppose for example, that a goods agent conceives it to be necessary for an additional siding to be laid down at a station. He makes a report to that effect to the manager of the district; the latter enquires into the facts on the spot, and, if he concurs in the necessity, reports his recommendation to the General Manager. The latter consults, in the first instance, the Chief Goods Manager or the Superintendent of the line, as the case may be, and, if his report be favourable, authorises the Engineer to prepare a plan and estimate. The plan, when ready, is subjected to the criticism of the District Officer, the Chief Officer, and of the General Manager, and, if all are satisfied, the Directors are next asked to authorise the necessary outlay. But even this is not all, for, finally, the plan has to be signed by the Chairman of the Company before the Engineer commences operations, and that gentleman, who keeps a watchful guard over the Company's purse-strings, has to be convinced that the expenditure is not only desirable, but actually unavoidable, before his signature is obtained."

And any one who has been in the way of knowing much of the Chairmen of large Railway Companies will probably have come to the conclusion that, as a class, they are not very easy people to impose upon.

Mr. Findlay's rules for the man who would undertake the efficient management of a line, or a large part of it, are very good reading, and will apply to many other forms of management. The final one is "always refuse to see chance callers," or any persons asking an interview merely because they think no one but the General Manager can give them a satisfactory answer. These are the caterpillars who prey upon one's precious time, and every one who has to manage anything important should turn a deaf ear to them.

The chapters on the signalling system and on the telegraph system of course do not pretend to go into full details, but the information requisite to enable the reader to understand the principle and working of the signalling system over 1,800 miles of railway is very clearly given, and will enable any reader of average sense to understand what to so many railway-travellers is still a kind of mysterious shorthand on a large scale. The short chapter on locomotives is of course merely a general statement of results, with a brief description and illustrations, reproduced from photographs, of some of the types of engines used on the London and North-Western system, of which there are eight different ones in all, of course each designed for a different class of work, just as different leading companies each have their own type of engine built in accordance with the requirements and nature of their own line in regard to gradients and prevalent style of traffic. In regard to this point, we observe that another American engineer, Mr. Dorsey, in that same number of the transactions of the American Society previously quoted, remarks on the wide differences in the rolling stock on English lines, and says "this is especially true regarding the locomotive. It is not possible that these different varieties, differing so much, can all be equally good. It is strange that the best type has not been selected and generally adopted, especially on the same road." This seems a rather shallow remark; on the same road the same type is kept, for the same class of work; but on different roads the requirements are different. The type of Great Northern engine, for instance, is built specially for the requirements of their road. Of course there is a certain pride or fashion with each company about the get-up and character of its engines; but as long as this is not allowed to affect their practical suitability for their special work, why not indulge it? It is more picturesque to have a special design of engine (using the word "design" for the moment in a quasi-artistic sense) associated with each main line, than to have a dull unnecessary uniformity. The North-Western is, no doubt, running more than one type at present for express passenger trains, because of the innovation of the compound engine, which they have not yet entirely adopted. In regard to this engine, the utility of which has been much disputed outside the London and North-Western circle, Mr. Findlay asserts that it effects "a very considerable economy of fuel"; and he ought to know. He does not give figures, certainly; but in spite of the natural affection people have for their own inventions, it does not seem likely that so practical a company as the North-Western would continue to build these engines (as we believe they are doing) for the mere pleasure of looking at and exhibiting them.*

In the chapter on "The Working of the Trains" the most interesting feature is the chart of the working of the company's trains between Liverpool and Manchester, given as an example of the manner in which the give-and-take between fast and slow trains is studied and arranged. This amounts to a kind of graphic representation of the system of trains by lines on a sheet of paper, which is divided from side to side for the hours of the day, and from top to bottom for the stations *en route*. Fast passenger trains, represented by straight thick lines, run right through every hour from top to bottom; goods and slow trains which have to start earlier and finish later are shown by thin lines crossing the path of the thick ones at convenient stations, and the places of shunting or waiting can be marked, and the time for waiting graphically shown. Thus the time-table is actually planned out in a form in which the whole arrangement of trains, instead of having to be computed by figures, is visible to the eye at once, as on a map. The author observes that his company, "though not laying claim to the doubtful distinction of running the fastest trains in the world" (the only rap at rival companies that we have noticed in the book), can fairly claim the reputation of being the most punctual line in the kingdom. We believe it can, and if one or two other companies show at least an honourable rivalry in this respect now, we think our memory of past times is correct in saying that the first example of this virtue was set by the North-Western. The contrast with some railways in this respect is remarkable. A few days ago the writer had occasion to start by the 7.25 p.m. main line train from Waterloo station. A crowd of people with luggage were waiting on the platform, and at four minutes before the time named for starting the train was slowly backed into position; at five minutes *after* the time a feint at a start was made; in two minutes more another feint; and at ten minutes after the hour we at last left. Imagine that happening at Euston!

The only point we disagree with in the chapter on train working is in regard to the author's serene contentment with the fog-signalling system, on which we have already expressed our opinion in noticing Mr. Acworth's book. Mr. Findlay no doubt shows that every trouble has been taken to make it as complete as possible, but we protest against regarding it as anything but a makeshift system. The care the company take of the men who have to go through this hard duty it is gratifying to read of; and other things in the book are interesting from the social point of view: the admirable system of wage-paying at Crewe, by which 2,000 men are paid and give receipts in half an hour and with military precision and method; and the manner in which Messrs. M'Corquodale & Co., the stationery contractors, contrived to find work for the daughters of the workmen congregated at Wolverhampton, by opening an envelope factory there; an example of making work for those who want it, which, though contrary to pure economic principles, seems in this case to have answered for both sides. Another passage in regard to employés (of whom by the way, all told, there are above 55,000) we will give ourselves the pleasure of quoting. Speaking of the various trains of all kinds and at so many varying rates of speed which have to be looked after and provided for all along the line in all weathers, the author says:

"Such a service cannot be carried on under all circumstances, whether by night or day, in fogs, in snowstorms, in wind or rain, and under all other adverse conditions, without entailing hardships and dangers upon the men engaged in the working; yet it is gratifying to be able to say that the vast army of men of all grades employed in the service of the various railway companies exhibit at all times a state of complete discipline and cheerful devotion to duty, which could not be exceeded by any body of men whatever, and which, although not perhaps so well understood or appreciated by the public as might be the case, reflects the highest credit on them as a class. Bearing in mind the vast importance of the interests committed to their charge, and the serious consequences that might easily arise from any carelessness or dereliction of duty on their part, it is a fact upon which the travelling public may well congratulate themselves, that their lives and limbs, their property and interests are confided to hands so trustworthy and reliable."

This praise, in regard to the great mass of English railway servants, we believe is fully deserved; that it should be so no doubt speaks much for the healthful effect of those two great moral stimulants, Responsibility and Discipline.

In his chapter on the relation of the State to railways, the author of course upholds (as he is almost bound to do) the flag of the companies against the Government in regard to recent legislation, though accepting the position; but he comments pretty fully, and with great sense and force, on the opinion which is every now and then aired by unpractical doctrinaires, in favour of the purchase of the railways by Government; and those woolly-brained patriots who are in favour of such a scheme should study Mr. Findlay's arguments, which they will find difficult to dispose of. We have always been quite content with the practical reason against any such policy, that the public will never be as well served or their interests as well cared for by a Government management as they are by at all events the best and largest railway companies at present, and that the life and vigour would all be taken out of our railway system by such a transfer, even if it were "within the region of practical politics," which we are inclined to think it is not. Those who want some other reasons against Government purchase, economical, political, and social, will find some forcible ones in the pages of Mr. Findlay's interesting and useful book.

* It will surprise some of our readers to hear that no less than seventy-three of these three-cylinder compounds have been built since the first one was turned out as a novelty in 1881.

Builders' Benevolent Institution.—The annual meeting of the subscribers and donors of this Institution will be held on Thursday, the 25th inst., at Willis's Rooms, St. James's.

ENGLISH ART AT THE PARIS EXHIBITION.

BY A FRENCH CRITIC.*

THE English school of painting—so justly glorious in the days of Reynolds and Gainsborough, of Constable, Turner, and Cattermole, offers to-day, for the French observer, a very attractive subject of study. Among some weak examples, the majority of the pictures in the British section of the Paris Exhibition show a power of style, an ability in execution, and a harmony of colour, which combine to render the collection one of great interest.

This assemblage of brilliant qualities is specially noticeable in the portraits. Among these I should not hesitate to place first the magnificent portrait of "J. C. Hook" by Sir John Millais, whose pictures of "un Whist à Trois," the three sisters, and his marvellous head of an old "Garde Royal," were so much admired in the Paris Exhibition of 1878. This picture of Mr. Hook, dressed in a brown suit and holding his palette in his left hand, is one of the *chefs d'œuvres* of the English section. What admirable expression in the meditative face with its network of wrinkles strongly indicated, but without the slightest hardness. The pose is simple but fine. It is to be regretted that the picture has not been hung at such an angle as to give it a better light (the lighting of the rooms being deficient) and get rid of some reflections which injure its effect.

The same remarkable impression of life, of power of modelling in the portrait, is seen in the same artist's portrait of Mr. Gladstone, which stands out vigorously from a dark background. The collection of pictures by Millais is sufficiently varied in style to give an idea of the versatility of his powers. "The Last Rose of Summer" is a magnificent portrait of a young brunette with her face shaded by a large feathered hat. Charming is the head of the child blowing "Soap-bubbles." The "Cinderella" is a pretty girl seated by the fire, the head and the bare legs modelled with great delicacy. The "Cherry-ripe" I do not like so much, a little child in white, of rather woolly texture, but pretty in colour.

Mr. Herkomer's "Chelsea Pensioners" exhibited in the 1878 Exhibition counts among our best recollections of the Exhibition of that year. This time the artist exhibits two remarkable portraits. That entitled—

> "Entranced in some diviner mood
> Of self-oblivious solitude,"

is that of a blonde young woman whose white bosom is contrasted by a black satin dress garnished with lace. There is, in this expressive head with its deep eyes and fine and firm mouth, a real sentiment of disdain of the outer world. The folds of the dress are treated in a masterly manner, yet so as to leave in the figure itself the chief interest. This portrait forms a striking contrast to that of "Miss Grant." Here the tonality is absolutely the reverse. The brown head of the young girl in a white robe stands out from a background equally white: the flesh is in full light, the head very finely modelled; perhaps the draperies are a little careless in execution.

The head of a woman, in black satin, on a garnet ground, exhibited by Mr. Luke Fildes, is also of much interest; the hand, the arm, and the neck are all beautifully drawn. Two portraits of young girls by Mr. Gregory display brilliant qualities of execution, that of Miss Mabel Galloway especially.

The complaint I made about the bad lighting of the portrait of Mr. Hook applies equally to Mr. Watts's portrait of Sir F. Leighton (an inferior work, by the way, to Mr. Watts's other exhibits to be noticed just now). The practice, eminently English, of putting a glass over an oil painting, has the inconvenience of causing reflections, which quite prevent the pictures being seen properly unless they are hung at a certain inclination.

Sir F. Leighton is an artist not only enjoying a great reputation in England, but well known in France, a corresponding member of the Institute of France, and Officer of the Legion of Honour. These are titles enough no doubt to overawe the critic, and yet may it be permitted to me not to like—not at all—the mannered portrait of "Lady Coleridge." The head is pretty, but totally wants expression. I prefer much to this head modelled in wax the "Lady Archibald Campbell" of Mr. Whistler, before seen in the Salon of 1885. That is nervous, fine, lifelike painting, though a little too *effacée* in tonality. Two portraits by Mr. Ouless please me very much, especially that of Cardinal Manning, whose ascetic head stands out powerfully above the red sacredotal draperies.

Archæological painting occupies a great space in this Exhibition. Mr. Alma Tadema is always the incontestable master of scenes of antiquity. He excels in reviving under our eyes the costumes, the jewellery, the instruments and utensils of Greece and Rome. But his personages contrast woefully, in their modern aspect, with the archaism of his details. His "Expectation" is a charming little *genre* painting, but seems painted after nature at Cannes or Mentone or Nice. In "The Women of Amphissa" the sleeping Mænads have no look of the wild and lascivious Bacchante of the ancients. They all represent pretty and blooming types of English women. In spite of this anachronism, there is an exquisite charm in this composition, irreproachable in drawing and which attracts one both by the composition of its lines and the harmony of the colour.

Nor are the personages any more Greek which Sir F. Leighton has painted in his large picture of "Andromache Captive": they are blond English women of an ideal type of beauty, grouped in a conventional Classic landscape devoid of real character. This pretentious painting, correctly drawn but smoothed and polished to excess, wants at once truth and simplicity. It recalls, under a different aspect, the conventional antiquities of which the late Gustave Boulanger made a specialty. The same reproach may be made against the "Mariamne" of Mr. Waterhouse, which has no antiquity but such as can be obtained from variegated tinsel dresses hired from a costumier.

I much prefer to these classical reminiscences the "Cophetua" of Mr. Burne Jones, which to a certain extent recalls the work of the early painters. The young "beggar maid" is beautiful, and the foreground group stands out boldly against an architectural background of very curious design. This scene, rather enigmatical no doubt to the public, presents a great harmony of line and composition.

The "Nymph" of Mr. William Stott is an Academy study, disagreeable in colour. With Mr. Watts we enter absolutely on the world of Dreams. His impalpable personages move in an ethereal fluid which seems to envelope their bodies with a soft and undulating light. In the "Judgment of Paris" the painter shows us three splendid women in opulent nudity. Then we come to "Love and Life," a graceful but somewhat playful (*mièvre*) composition, to which I prefer the "Diana" leaning over the sleeping Endymion. The draped torso of the goddess is perfect in design. The same undulating line is seen in the female figure clad in pale blue and bathed in a celestial light, who personifies "Hope." The general tone of colour of these paintings, which takes one by surprise at first, is harmonious. This original and indefinable painting proceeds from a mood of poetic abstraction such as strikes the French mind, little accustomed to metaphysics in painting, with astonishment and bewilderment. One has to take time to get accustomed to it before realising its exceptional qualities in design and execution.

Historical pictures are not numerous, and I recall one only which really pleased me. This is a small picture by Mr. Andrew Gow, showing the French Garrison issuing from Lille in 1708. The figures of the wounded soldiers marching in the midst of a devastated country are marvellous in their expression of resignation and of privations nobly borne. In the foreground a group of wounded English officers salutes the army as it marches out with the honours of war. The scene is laid in a landscape soberly treated, but where everything conduces to the general effect of a composition full of life and interest.

We in France, who are almost tempted to consider as a sign of decadence the intrusion of larger and larger-sized paintings of *genre* on to the walls of the annual *Salons*, may have a certain satisfaction in noticing that the same kind of movement is taking place in England. One must therefore recognise it as a general tendency of modern art to abandon "la grande peinture" and the pages of history, in order to reproduce in their reality scenes from every-day life. Certain painters, it is true, endeavour to escape this by means of costumes of another day, and thus to imagine themselves the historians of the life of past generations. But in spite of the three-cornered hats, silk stockings, and powdered wigs, is not the picture which Mr. Marcus Stone entitles "The Gambler's Wife" essentially modern? And Mr. Orchardson's "Her First Dance," is not that also, in spite of the accessories, a lively picture of bourgeois manners of the present day? Mr. Orchardson, whose palette is peculiarly original and his own, contrasts with the juvenile grace of the *débutante* the pretentious elegance of her partner. Around the principal group are seated here and there the relatives and friends, whose attitudes and expressions are full of life. This interior scene, simply rendered, is full of true observation. His "After" is the result of a "Mariage de convenance." The aged husband, married for his fortune alone, is seated in an attitude of deep despair before the fire. Grief has paled his complexion and reddened his eyes. Behind him is the luxuriously-furnished dinner table almost untouched in the deserted room, on the wall of which hangs the portrait of the faithless one to renew his grief and his regrets. In this scene, treated with the greatest simplicity and full of meaning, every detail combines to illustrate the moral drama which has been played. The same artist's "Master Baby" on a sofa, and amused with his mother's fan, is less successful; the child is charming, but the painting is rather careless, and the prevailing yellow tone is disagreeable.

There is a great charm in the "Intruders" of Mr. Gregory. Two young girls, one standing, the other seated in a boat, are looking at the swans; the sun sheds a bright light on the scene, on the clear water and the blue and pink dresses of the two women; a very fresh and bright landscape forms the framework of the scene. "The Penitent" of Mr. Luke Fildes, weeping on the threshold of her former home, has stirred the attention of the whole village; the women are grouped about her, the children look on with curiosity. There is much sentiment in this scene, which is full of well-treated detail, and which I prefer to the painter's "Venetians" seated at the edge of a canal.

The little picture by Mr. Whistler, "Harmony in flesh-colour and green," and which represents Chinese women grouped on a balcony, has the defect of being too sketchy in style; but though I may be accused of being an "Impressionist," this little picture attracts me much by its fine quality of colour. I note also here Mr. Leslie's "Thames Roses," a pretty young girl reclining by a window through which is seen the river and the green fields; "The Benediction," a mediæval scene by Sir J. D. Linton, well treated and full of interesting detail; and the "Homeless and Homeward" of Mr. John Reid, which recalls, with less of mere realism, the kind of scenes which Messrs. Gœuneutte, Geoffrey, and Pelez parade before our eyes in every Salon exhibition.

Landscape, and especially sea painting, is largely represented in the English collection. We meet Mr. Gregory here again with two

* The principal pictures in the English section are all well known here, and have been noticed by us before. But we thought it would be of some interest for English readers to see how they appear to French eyes; hence his article, translated from the French of a Paris critic.

interesting landscapes, "A Scotch Hillside" and a luminous view of Venice, a little hard in texture, but showing great precision in the details of the architecture. This same precision in architectural detail is seen in Mr. Wyke Bayliss's "White Lady of Nuremberg," an essentially architectural picture far superior to those which M. Lansyer exhibits at the Salon.

Mr. Hook is *par excellence* the painter of fisher-folk and sailors, whose types he renders with the greatest spirit and with the picturesqueness of truth. Of the three pictures he exhibits, I should place first that entitled "The Day for the Lighthouse." Here is fine and solid painting; the air circulates in it and the light plays on this stretch of shore where the peasants with poultry and other provisions wait, at low tide, for the boat which is to take them to the lighthouse. The same power of touch, the same intensity of truthfulness, are seen in the composition entitled "It is an Ill Wind that Blows Nobody Good," where two fishers, a man and a woman, drag to the shore a piece of floating wreck. The sea has no secrets for such an observer as Mr. Hook, who knows how to render its numberless effects with the same surety of eye and hand. In "The Close of the Day" the sun is setting beyond the sea which it floods with light; in the foreground is a green solitude of cliffs.

Mr. H. Moore's "Newhaven Packet" is a fine sea-piece of great simplicity; the "Clearness after Rain" by the same artist is a little heavy in handling, but there is, in this immense stretch of sea which is almost blended with the sky in the distance, a powerful effect very finely rendered.

It is to be regretted that the hanging committee has placed Miss Montalba's "Piazza Inundated" so badly. This small picture merited better than to be hung so much too high. The sky is perhaps rather heavy, but it is a very pretty effect rendered in a very interesting manner.

Among other works, Mr. Knight's "Lifting Mist" is a pretty landscape showing an effect of storm. Mr. Leader's "At Evening Time there Shall be Light" is a fine scene very well treated in respect of light. As to Mr. Goodall's "Memphis," it is an Egyptian landscape displaying that kind of red effect of colour with which M. Théodore Frère has wearied us for so long. I note also good landscapes by Mr. Wyllie, Mr. Parsons and Mr. Mark Fisher. Mr. Vicat Cole's "Autumn Leaves" is a kind of *trompe-d'œil* painting, which looks as if it were made by squeezing real vegetation between two sheets of glass.

The English watercolours occupy the final room, one well worthy of attention. Among the best I should cite two charming drawings by Mr. Boyce, "The Porte Neuve at Vezelay" and "Bougham Castle"; "Magdalen Tower and Bridge, Oxford," by Mr. Fulleylove; the "Entry to the Port of Marseilles," by Mr. Callow; Mr. Collier's "Moors near Moel Siabod"; and Mr. Langley's "Among the Missing." Mr. Alma Tadema sends two fine watercolours, "Pleading" and "Music." There is a great deal of atmosphere in Mr. Aumonier's "From Hedsor Hill," and I like very much the "View from Mount Harry" by Mr. Hine. I should mention also especially Mr. Thorne Waite's "Dividing the Flock," and an amusing little *genre* scene by Mr. Wyllie, "Return of the Life Guards."

Among engravings and etchings are two reproductions made by Mr. Herkomer from his "Miss Grant" and "Entranced," that of the portrait of Mr. Gladstone by Mr. Barlow, and a number of pretty and amusing designs by Miss Kate Greenaway.

The works in sculpture are few and certainly inferior to the paintings. But special mention should be made of the "Perseus" of Mr. Gilbert, a young artist with a great future before him, who also exhibits a beautiful statuette "An offering to Venus," and some heads full of expression and feeling. Sir F. Leighton's "Needless Alarms" is rather trivial but pretty. The "Dryope" of Mr. Browning is a bronze figure, heavy and massive in proportions. Mr. Thornycroft's "Medea" seems to me rather mediocre; and I meet here again, but not with much satisfaction, a figure of "Peace," exhibited in the Salon of 1888 by Mr. Onslow Ford, who however contributes a very good bust of the Lord Mayor of London, Mr. Whitehead.

In conclusion, the English Fine Art Exhibition at the Champ de Mars, which it is to be regretted is not nearly so full or representative as in the 1878 Exhibition, suffices nevertheless to prove that fine works are not wanting to-day on the English side of the Channel; that English art, which has produced some very great painters, continues to hold a considerable position in contemporary art; and that her modern school shows itself worthy of the great traditions left to it from some former generations.

NOTES.

SEVERAL important conferences have been held during the last week or two between the representatives of the railways and deputations of traders, in accordance with the Board of Trade circular relating to objections to the new rates. Mr. Courtenay Boyle, as representative of the Board, attended one of these meetings, and explained that anything they could do to facilitate the settlement of the questions in dispute would be done; but that 914 objections had been sent in by individual traders, and he hoped that many smaller matters might be settled by negotiation. The discussions at these conferences have been very much on lines now quite familiar to all who have followed the subject, but one or two important statements have been made by the railway officials as to their position and intentions. At the meeting we have already alluded to, Mr. Beale (Midland Railway) said that the railway officers had directed their minds to a working classification to submit to Parliament; but had come to the conclusion that such a course would inflict injury upon the traders. This was confirmed and amplified a few days later by the General Manager of the Great Northern at a conference with the Agricultural Engineers' Association. Mr. Oakley positively stated that they would continue to use their working classification independently of that to be authorised by Parliament, regarding the latter simply as a limit beyond which they could not advance. Rightly or wrongly, the traders have assumed that,—at least as far as the placing of articles in their respective classes is concerned,—the proposed Parliamentary classification was to be the working classification of the future. Seeing that the former is in so many respects identical with that at present in use at the Railway Clearing-house, we are inclined to think that this view is likely to prove correct; and that, as was remarked by one of the speakers at this Conference, the companies would soon find it inconvenient for articles to stand in different classes in the respective classifications. We think that the margin for contingencies to which we have always said that the companies are justly entitled, should be provided for in the mileage rates, and that it would be unwise and unreasonable to meet them by shifting goods into higher classes. The class should be definitely fixed, with some degree of elasticity in the rate applicable to it. Hence, all such objections as are founded upon the "moving up" of goods out of the class in which the Railway Clearing-house has been content to place them, are deserving of favourable consideration at the hands of the Board of Trade.

THE Scottish National Portrait Gallery, Queen-street, Edinburgh, was inaugurated on Monday, the 15th inst., by the Marquis of Lothian, Secretary for Scotland, in presence of a large and distinguished audience. As our readers are aware, the Gallery was erected from the funds of an anonymous donor, and much speculation existed as to who the patriotic Scotsman was to whom the country was indebted for the munificent gift. This speculation was set at rest by the Lord Justice General, one of the Commissioners of the Board of Manufactures, who explained the circumstances under which the original donation was made, and the negotiations between the Board and the Government, under which the Government agreed to contribute 10,000*l*. The donor is Mr. John Ritchie Findlay, of the *Scotsman*, and his contribution to the undertaking was stated to be 50,000*l*. Mr. Findlay, who was present, was called upon by the Marquis of Lothian to address the meeting, and, in doing so, said that he was proud of the approbation bestowed upon him, and happy to be present at the inauguration of a project which had for him been, for a time, a mere day-dream, and which had taken concrete shape in the institution so handsomely housed in the building in which they were assembled. Lord Glencorse, in the course of his remarks, said that the style of architecture adopted by the architect (Dr. Rowand Anderson) was, in his own words, "the Secular Gothic of the latter half of the thirteenth century,—a style that lends itself readily to the purposes of the building, and secures the greatest amount of light to those rooms which must be lighted from one side only." There is one feature in connexion with the design to which he desired to call attention, namely, the niches which are left all around for statues. It would surely be most appropriate that these niches should be filled with statues of eminent Scotsmen of past times. The people of Scotland generally were looked to to provide the statues, and if one were obtained the rest would be sure to follow. As regards the external aspect of the building, a word of warning would not be out of place as to the judging of it before it is actually completed. The front of the building, as it originally stood before the wings now in course of erection were commenced, presented, undoubtedly, a somewhat bald outline, but when the wings with their towers are completed and these are connected with the central building by means of a parapet running round the whole, he ventured to say that there would not be a finer building in the City of Edinburgh,—or, perhaps, in Scotland. Lord Lothian suggested to the Board of Manufactures the desirableness of maintaining a high standard in regard to the portraits which should be admitted. We understand that the forthcoming Art Congress is to be accommodated in the new building.

THE model form of a Provisional Order under the Electric Lighting Acts, 1882 and 1888, for a Metropolitan area, will be carefully studied by all those who are financially or otherwise interested in the schemes now being pushed forward for the lighting of London and some of the more important provincial towns. This recent publication is largely based on material of a similar character, which has already been circulated and duly discussed; we do not propose, therefore, to venture upon any criticism of those clauses which deal with such matters as definition of area, of supply, security to be given for execution of works, revocation of order if mains are not laid down after due notice has been given, &c., but attention may be directed to certain new points which have a very important bearing upon the broad question of the supply of electricity to the metropolis. On a previous occasion we noted the desire of the County Council to become the controlling body of the electric light in the county of London, and, excepting the powers of purchase given by the General Statute to local authorities, the Council get practically all they asked for given them in the Order, by means of which the Board of Trade seek to transfer to the County Council the powers vested in this latter body by Parliament. Any possible difficulty is got over by a process called on the other side of the Atlantic "bull-dozing"; the Companies may voluntarily agree to submit themselves to the control of the Council, or they may go without their orders. That methods of this

nature would be resorted to was, to a certain extent, foreshadowed in Major Marindin's report; but such regulations as those relating to testing, or the appointment and duties of electric inspectors, must come as a disagreeable surprise to many. Electrical engineers will remember the kind of thing they had to contend with at the hands of inspectors, in the early days of the electric light, when the insurance companies were alarmed at certain fires, which had occurred entirely from bad workmanship, and looked upon the introduction of electricity into a building as a source of great risk. It was not until Mr. Musgrave Heaphy fully investigated the whole question, and drew up the now classical Phœnix Rules, that a scare which promised at one time to become a serious bar to the progress of the light eventually turned out a blessing by ensuring good workmanship. Under the Order electric inspectors are to be appointed whose duties will be to test mains, when directed to do so by the appointing authority; to test the service lines whenever a person supplied with electricity by the undertakers desires it; to test the instruments belonging to the undertakers; and to certify meters. On adding that the undertakers have no control at all over the performances of these gentlemen, unless we so regard the privilege of being obliged to pay the inspector's fees even should the plant of the undertaker prove perfect, it is needless to point out the hardships and possible abuses that will inevitably arise through such a system. The handling of technical details by untechnical, irresponsible bodies leads to but one result, and we look for any compensating advantages in vain.

ON Saturday last a number of persons interested in sanitary work, members of the medical profession, sanitary engineers and others, visited No. 5, Queen's-gate, by invitation, to inspect the sanitary arrangements just carried out there under the direction of Mr. Rowland Plumbe. The house has recently become the property of Dr. Wakley, the editor of the *Lancet*, and by his wish has been laid out, at considerable cost, as an example of what a London house should be in its sanitary arrangements and fittings. The most notable feature in the house is the laying of the drains, which necessarily pass under the house. All the existing earthenware pipes and fittings have been removed, and cast-iron socketed water main pipes in 9 ft. lengths have been laid, the joints formed in molten lead; the pipes are coated with Dr. Angus Smith's solution. The intercepting and inspection chambers are lined with white-glazed bricks; there are three of them, one at the back, one in the house where the soil-pipes join the main drain, and a principal one in front; but as these latter two are actually in the house (unavoidably), the manholes have the protection of Broad's air-tight covers in stone frames, then six inches of prepared silver sand pressed down, and the whole covered with a Phillips's "Brontes" air-tight cover. Nothing can get through that; but it must not be concluded that it is as desirable to have intercepting chambers within the house, with this protection, as outside it, even with more ordinary protection. A perpetually-acting flushing system is provided from the sink waste at the head of the drain. This is altogether a splendid piece of house drainage work. The water-closets are Dent & Hellyer's "Optimus" closets, but we regret to see that the old-fashioned casings to the seats are retained in the principal closets. The water pipes are laid on to the fire-main, thus ensuring a constant high-pressure supply of water, but this can hardly be regarded as a model arrangement that can be generally followed in London. Among other convenient additions is the provision of a separate stop-cock to every pipe in the building, so that in case of an accident to any particular pipe the water can be shut off from it without stopping it off from the rest of the house. This is a great convenience, which might well be more largely adopted. The floors, walls, and ceilings are nearly all treated so as to be washable (the drawing-room appears to be an exception); the wall and ceiling coverings are anaglypta, lincrusta and other pressed papers (somewhat too rough in surface for our idea of London wall-papers); the floors of reception-rooms are laid with parquet flooring and the passages with stone and mosaic paving, also with the object of being washed. Perhaps the idea of a model London sanitary house might have been more fully realised by discarding the use of papers altogether; but of course finishing the walls in any decorative manner without paper would mean abnormal expense. The construction of the drains, indeed, is at a cost that would be prohibitive in many cases; but where it can be afforded nothing can be better or more enduring than the way it is done here.*

WE fear that the useful little Bill as to the names of railway-stations, which has recently been introduced into the House of Commons, will scarcely become law this session. It may, however, act as a hint to the railway companies that if they do not take this matter in hand, Parliament will make regulations for them. One provision in the Bill is that the letters which form the name of the station shall not be less in size than the largest of the letters in the advertisements fixed to the adjacent wall. It would be better, however, to lay down a distinct rule as to the size of the letters, for there will be no object in having them of the exaggerated size which is to be found in some advertisements. The clear space of 10 ft. all round the name of the station is very necessary, and some proviso should also be introduced to meet the case of stations on the underground lines, which are not properly lighted in the day-time. But is it not in some respects an anomaly that Parliament should have to deal with such a subject as this, which the Board of Trade ought to have jurisdiction to manage; together with various other details connected with the arrangements at stations?

THE case of Presland *v.* Bingham, which is reported in the current number of the "Law Reports," is not without interest in regard to the law of light. The obstructions there complained of were packing-cases which rose many feet from time to time above a wall. This wall was, after a time, raised above its former height, and it was contended that the defendant had a right to do so because the packing-cases were an interruption of the plaintiff's light within the meaning of the Prescription Act. Mr. Justice North took this view, but was overruled by the Court of Appeal, on the ground that having regard to the nature of the so-called interruption, it could not have been one which was continuous for a year. The most important point decided concerned the question of evidence, and as to this it will be best understood by a quotation from the judgment of Lord Justice Lindley, which lays down the law clearly and shortly:—"If," he says, "the plaintiff proves access of light, and, in the course of putting in his evidence, there is no sign of any interruption, he has done all that it is *primâ facie* necessary for him to do. If in putting in his evidence it appears there is some material structure which has, more or less, obstructed his window, it is for him to show that it has not lasted a whole year. If he shows that there is something like this (the packing-cases), a fluctuating obstruction, sometimes high, sometimes low, sometimes none, then it is for the defendant to show he has been obstructing for the whole space of twelve months, and that the plaintiff has acquiesced in the obstruction."

WE have had to record, in another column, the death of an architect who had a rather remarkable career,—the late Sir James Picton of Liverpool. Though Sir James was no doubt a man of considerable natural ability, his life may be said to be a prominent example of the success which may be attained by persistent hard work and perseverance, coupled with the blessing of vigorous health. He himself told us that he "married on 120*l.* a year"; he has ended his life as one of Liverpool's most prominent and successful men, and his success seems to have been continuous and unbroken during the greater portion of an unusually long life. Perhaps, too, his enjoyment of excellent health up to almost the day of his death in his eighty-fourth year, may be added to the many facts which seem to testify that there is no better receipt for long life and continuous health than hard work. When Sir James Picton practically retired from the practice of his profession, at an advanced period of his life, it was only to take up with equal energy various other studies. The buildings which were carried out from his designs in Liverpool, in his earlier days, the most prominent of which were large blocks of offices with architectural façades of considerable elaboration, form very favourable examples (especially for their period) of the application of Renaissance forms to modern street architecture; and he did not repeat himself in these various buildings of the same class, but aimed at giving originality and a special character to each.

THE *Antiquary* for the present month contains an interesting article by Mr. F. R. McClintock on the old Spanish town of Cuenca, now brought by a new railway within easy reach of Madrid. A grand bridge and the Cathedral are the principal architectural attractions; an interesting and tolerably detailed description is given of the latter, which appears to be a building possessing a good deal of interest of a curious and out-of-the-way kind.

WE mentioned some time ago a form of drain-pipe which Mr. Norman Shaw was employing, consisting of half or invert pipes only with flat top-slabs cemented on. The idea was afterwards claimed by Mr. T. L. Watson, in a friendly letter, as having been the subject of a prior patent of his. We have now received a circular announcing that this form of drain is offered to the public as "The Channel Drain-Pipe: R. Norman Shaw's and T. L. Watson's patents."* Various advantages are claimed for this form of pipe, not all of which can be sustained. The great matter is that the whole invert of the drain can be seen when complete and laid down, before putting on the top slabs. With care, however, it is possible to leave circular drains perfectly smooth inside. The statements that the "channel drains" can be laid more accurately, used at less fall, and tested for tightness more accurately than ordinary pipe-drains, we can see no ground for. Nor is it the case that the joints can be more solidly and more tightly made than with round pipes; in view of some of the recent improvements in jointing round pipes in cement the statement is absurd. "The smoke test is less necessary than with ordinary pipes" (why?), "but the covers offer greater facilities for applying it." That is just what we fear may be the fact, though in a sense not contemplated by the promoters. The cement joints are where the smoke usually finds weak points in ordinary drains; and here the whole top is a cement joint. The claims made of superior economy, that the pipes are more easily handled, lighter in carriage and more commodious to pack, and that they "can be used with loose covers for carrying off surface and roof water while the building is in progress," are all quite valid. The experiment is worth trying, but the promoters have made the common mistake of claiming too much; and we certainly cannot regard a cement-jointed slab

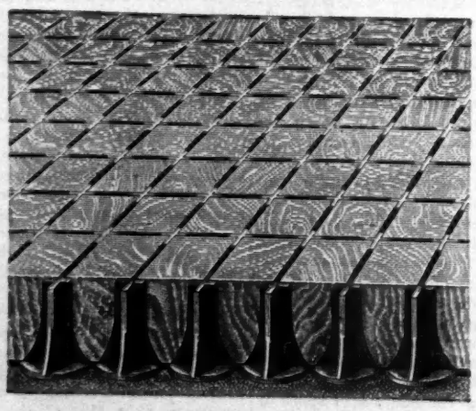
* The contractor for the whole of the works, alterations, repairs, decorations, &c., is Mr. Herbert Hanks. The house is being fitted with electric lighting by Messrs. Laing, Wharton, & Down, under the direction of Mr. Rant. The hot-water and stove and range work are being fixed by Messrs. Ashton & Green (Limited). The Mosaic work by Messrs. De Grelle, Houdret, & Co. The painted windows by Mr. Arthur J. Dix. The parquet flooring by Messrs. Barnett.

* Manufactured and supplied by the following makers:—J. C. Edwards, Ruabon, North Wales; Henry Sharp, Jones & Co., Westminster and Poole, Dorset; Wenham & Walters (Limited), London and Croydon.

cover as likely to be equally impervious with a glazed stoneware culvert.

THE sale at Salisbury on the 23rd inst. of the late Sir Robert Loder's Wiltshire property will comprise the Wilsford House (823 acres) and Heale House (719 acres) estates. To the latter belongs a historical residence,—Heale House, lying within four or five miles from Salisbury. We take the following particulars from an account of his escape from "Sultan Oliver," after the fight at Worcester, as dictated by the King to Pepys, at Newmarket, in October, 1680,* and from the scarce Boscobel Tracts, Parts I. and II., with the "Claustrum Regale Reseratum, or The King's Concealment at Trent," written at the time by Thomas Blount, author of "Fragmenta Antiquitatis," and other works. On Oct. 3 the King, under guise of William Jackson, "a poor tenant's son," and with Mrs. Julian,—he calls her Judith,—Coningsby seated on the pillion of his saddle, set forth from Colonel Francis Wyndham's manor-house at Trent, near to Yeovil and Sherbourne. He was accompanied by Colonel Philips, and attended by Henry Peters. Having halted in Mere, where they dined at the George Inn, the party in the evening gained Heale House, the home of Mary, widow to Lawrence Hyde, an elder brother of Sir Robert Hyde, Justice of the Court of Common Pleas. At Heale House the King abode for ten days, riding out each morning and returning when the servants were at supper. On one such day he and Philips visited Stonehenge, where, as the latter records, "they found that the King's arithmetic gave the lie to the fabulous tale that those stones cannot be told alike twice together." The closet which Charles mentions as forming his "hiding-hole" at Heale is still shown there. At two o'clock in the morning of Monday, October 13, he and Dr. Henchman (afterwards made Bishop of Salisbury; Charles calls him "Henshaw") started from Heale on foot, being soon joined by Lord Wilmot, Colonel George Gunter, and Mr. Thomas Gunter, for Mr. Thomas Symons's house at Hambledon, in Hampshire, where they arrived on that same night. On Wednesday, October 15, the King and Lord Wilmot sailed from Shoreham in Francis Mansel's 60-ton vessel, its master Nicholas Tettershall, which after the restoration lay moored awhile in the Thames off the Privy-stairs, Whitehall.

WE learn that a new attempt to adapt iron to the paving of streets is now being made in Sheffield. In this system, illustrated in the accompanying cut, the iron



Iron and Wood Street Paving, Sheffield.

is used in combination with wood, with pitch as an intervening material to bind them together. As each piece of iron has an independent foot or base there is no leverage action when the weight of traffic comes upon it. The trial piece has been in use about two months, and is said to have stood well so far, though laid in a street which carries very heavy traffic. As is usual in other systems of pitching, a concrete foundation is the first requisite for this pavement. Upon this is laid a thin coat of asphalt, on which the irons are bedded. Between the irons are driven cubes of wood, each cube fitting into the angles of the irons, as shown in the cut. The interstices of the cubes are filled with pitch as in ordinary wood paving. About thirty-eight square yards has been laid down in Saville-street by Mr. G. Carr, contractor, who has had a smaller piece in use on his premises for above a year and a half. We are informed that the iron is not subjected to any anti-corrosive treatment, the pitch being depended on to keep it from rusting.

IN our report of the proceedings at the London County Council last week, we mentioned, in connexion with the election of Chief Engineer to the Council, that the names of the seven candidates first selected from the thirty-five applicants for the appointment did not transpire, and that we had not been able to obtain them on application to the officials. In reply to a second application for the names (which we made by letter), we received the following letter from the Clerk of the Council:—

"London County Council,
Spring-gardens, S.W., July 11, 1889.

SIR,—In reply to your letter just received, I have to inform you that the lists of candidates for appointments are printed solely for the use of members of the Council, and are not in any way public. I regret, therefore, that I do not feel authorised to accede to your request.—Yours truly,

H. DE LA HOOKE."

What possible objection there can be to making known the names of the candidates, especially those of the seven gentlemen first selected, we are at a loss to conceive. We submit that the public have a right to know the names of the candidates for so important an appointment as that of Chief Engineer, who will have in his keeping, to a great extent, the health and comfort of the inhabitants of the metropolis, and who, in all probability, will be responsible for the expenditure of millions of money. The technical and engineering journals, we contend, have an especial right to information of the kind we sought, and the County Council,—which is as yet on its trial,—is certainly ill-advised in maintaining secrecy of this kind. Since we wrote last week, a correspondent has kindly furnished us with the names of the seven candidates first selected for the appointment in question. They were Messrs. Oswald Brown, M. Inst. C.E., Westminster; Mr. Clement Dunscombe, M. Inst. C.E., Borough Engineer of Liverpool; Mr. J. W. Girdlestone, Bristol; Mr. Thomas Hewson, Borough Engineer, Leeds; and Messrs. Binnie, Duckham, and Gordon, whose names appeared in our last. We are certainly at a loss to comprehend on what grounds so eligible a candidate as Mr. Dunscombe was ruled out of the "final heat." We do not for a moment mean to say that by appointing Mr. Gordon to the high position of Chief Engineer the County Council have not made a good appointment; on the contrary, we think it is a very good appointment, Mr. Gordon having had large experience in carrying out important municipal engineering works both in England and in Germany. And we mean no disparagement of Mr. Gordon when we express our opinion that Mr. Dunscombe would have been a more formidable competitor for the appointment than either of the other two gentlemen who were selected with Mr. Gordon for the final voting.

IN reference to a "Note" in our number of the 6th inst. as to an alleged difficulty with "sprinklers" at a fire in the Victoria Flour Mills near Wellingborough, we have received an elaborate statement from a firm of fire engineers whose special form of sprinklers had been fitted there, to say that nothing of the kind happened, and a letter from the manager to say the same. As no names were mentioned and no maker blamed, the object of the communication is merely of course an advertisement, with which object similar letters have been got into some of the daily papers,—letters which would lead any reader to suppose that we had gone out of our way to make an attack on "sprinklers" in general and these special makers in particular. We simply commented on a published statement sent to us from a local paper, that there was difficulty in stopping the sprinklers; how, it was not said—it might have been the blundering of an employé; and we drew attention to this possible inconvenience as a thing to be guarded against. If country newspapers publish incorrect statements we cannot help it, but we have some reason to think that the account was not so entirely without foundation as is now represented. It is not to be supposed, however, that any firm of patentees would neglect so convenient an occasion for exercising the divine right of advertising themselves.

CONSIDERING how few occasions we have in modern life (or how few we take) of making up beautiful spectacles of any kind, it seems a pity that London does not more often take advantage of her river for such spectacles of illuminated water *fêtes* as that which followed Moulsey Regatta last Saturday evening. There was no very elaborate or costly effort made after all, but the spectacle of the crowd of illuminated boats moving about, with the reflections from the water, and the display of rockets and set fireworks as a centrepiece, was something really beautiful and fairylike,* and worth seeing in these degenerate days when there are so few pretty sights to see. Evelyn describes the water procession of Charles II. and his Queen from Hampton Court to London as not equalled even in Venice for picturesqueness and splendour. Why should not modern royalty set an example of reviving some of these splendours? Nothing is more easy than to get beautiful effects when a river is a main element in the scene.

Civil and Mechanical Engineers' Society.—On the 11th inst., by permission of Mr. J. H. Greathead, Engineer to the City and Southwark Subway, a limited number of members of this society were enabled to visit the station works at the Kennington Oval shaft. Amongst those present was Prof. Henry Adams, President-elect of the Society, who, in thanking Mr. Greathead and his resident engineer, Mr. Mott, said he felt some confidence that his wish for the success of the undertaking would be fulfilled, when he considered the economical way in which the works had been designed and executed; in fact, he understood that the cost per mile for this railway was only one-fifth of that of the recent City extension of the Metropolitan Railway.

* The MS., preserved in the Pepysian Library at Magdalene, Cambridge, was first published by Sir David Dalrymple in 1766. It is both genuine and authentic.

* Those who enjoyed it most have been edified to read in the *Times* that "a heavy rain in the evening spoiled the illuminations." The weather looked threatening, and a slight shower fell at dusk; and seeing this no doubt the typical reporter, who wanted to get back to town, thought it would be safe to say "rain." The weather was perfectly fine during the illuminations, and the show a complete success.

THE LINCOLN AND NOTTS ARCHITECTURAL SOCIETY AT BOURNE.*

THE first church visited on the second day's excursion of the Lincoln and Notts Architectural Society at their recent Bourne meeting, June 26, was that of Thurlby, standing on the east bank of the Car Dyke, a navigable canal, cut by the Romans as a catch-water drain on the edge of the fens, running forty miles from the Welland at West Deeping to the Witham, a little east of Lincoln. The church is one of unusual interest, from the variety of styles exhibited. The angles of the western tower show long-and-short work. The nave arcades are Norman, and also the chancel walls, as proved by an internal string-course, and a zigzag arched sedile. Tall side lancets show that the chancel was altered in Early English times, while its walls were heightened, and a fine east window added in the Perpendicular style. Transeptal chapels of good character, with squints into the chancel, were added in the thirteenth century, to which shafted wall arcades impart much dignity. It is interesting to notice the adaptations received by the eastern bays of the nave arcade to make them work in with these later chapels. Indeed, the whole church, from its interlacing of styles, affords a piece of architectural development of great interest. The western tower, with its traces of pre-Norman work, grows out of Early English into Decorated, and is capped by a spire of that style, of such stunted proportions that, as the Bishop of Nottingham pleasantly said, "it looked as if it would be the better for a little forcing." There are north and south porches, both Early English, the inner doorway of that to the south being Norman. There is a chapel to the south of the chancel, with a somewhat perplexing arrangement of windows. The original plan has been disturbed by a large late Perpendicular window in the centre of the wall space, to the east of which is an Early English lancet, very near the ground, and to the west a plain square opening, like a low side window, above which is a very pretty small, two-light, square-headed, transomed, decorated window, set high in the wall, perhaps intended to light a gallery on the top of a screen dividing this chapel from the aisle. On the north wall is a shallow blank arch, with a squint in the corner. An aumbry in the chancel retains its doors. The piscina on the south wall is of very singular and rather clumsy design. The trefoiled arch is supported by four shafts, two on each side (::, like the four on a die), the abaci of which are of enormous projections, serving for the shelf. The rood-stair comes down awkwardly into the north chapel without any turret, the lower steps having been removed to give more room.

The next church, Baston, proved far less interesting. The disengaged western tower, of excellent masonry, with square battlemented pinnacles, as at Bourne and Edenham, is the best feature. The north and south arcades are of four bays, with Early English pointed arches springing from low octagonal piers. The most noticeable thing about this church is the arrangement of the west end of the south aisle. This appears to have formed a separate chantry of two bays, cut off from a similar chantry in the eastern two bays by a transverse wall, of which indications still exist. The position of this wall is marked internally by a much broader pier at this place in the south nave arcade, and a narrow bay on the south aisle wall, strengthened by two buttresses, with decorative pannelling between them, which is also seen at the west end of the aisle. A small bell-cot, probably connected with this chantry, caps the western gable of the aisle. The whole arrangement is curious and unusual.

The church of Langtoft possesses a very noble tower of Early English date, surmounted with a Decorated spire, with two ranges of gabled spire-lights. The parapet is corbelled, and there are no pinnacles. It stands at the west end of the north aisle, disengaged on three sides, and springs at one bound from the ground into the sky, gradually lessening as it ascends, with plain flat buttresses rising on richly moulded basement, the whole being of clean, closely-jointed masonry. The whole design and execution is admirable. On the south side of the tower a blocked arch, with richly-carved Decorated capitals, indicates an annexed building, which has been destroyed greatly to the advantage of its proportions. Another remarkable feature is the Decorated south chapel to the chancel, gabled, and with exquisite gabled buttresses, and tall, square-headed three-light windows, recalling those of the chancel of Tideswell. The arcade dividing this chapel from the chancel is of two dates—the western half Early English, marking the existence of a previous thirteenth-century chantry; the eastern of two bays, Decorated, of great richness, the capitals elaborately carved. There are two canopied piscinas of unusual size and magnificence in this chapel, one in the south-east corner, the other on the west face of the east respond on the north side; and some exquisite corbels of foliage. The contrast between the coarseness of the attempts at figure carving and the freedom and beauty of the foliage is very striking; the one almost as good and the other almost as bad as it can be. The nave arcade of four bays is Early English, with clustered shafts. Some of the capitals have been remodelled in Decorated and Perpendicular times. Under the embattled parapets of the aisles and clearstory are richly-sculptured cornices, showing the ball-flower, *fleur-de-lis*, and other conventional ornaments. The whole effect of the well-proportioned interior is light and pleasing. In singular contrast to the Mediæval architecture of the exterior, the south porch is a composition in Roman Doric, well designed and certainly costly, but sadly out of place.

The next halt was at Market-Deeping. The church is of considerable size, but of no special interest. The square western tower is dignified and well proportioned, and of excellent masonry, entirely Perpendicular, probably by the same builders as that of Edenham; the belfry windows are of the same design,—coupled two-lights under one containing arch. The external walls of the aisles are Decorated, with some good gabled buttresses and square-headed two-light windows. The chancel is Perpendicular, spacious and lofty, but unattractive. The nave arcades of three bays are Early English, with piers of clustered shafts. The arches are semi-circular on the north and pointed to the south. On the north side we have the heavy continuous circular abacus which has already been noticed. On the south, the abacus more gracefully breaks over the shafts. In the chancel are gabled sedilia of coarse workmanship, the crockets painfully resembling snails, and a piscina with ogee canopy. There is a plain, low side-window in the south wall of the chancel. The window above it contains roundels of coloured glass depicting scenes in the life of St. Guthlac, the patron saint of Deeping, copied from a MS. in the British Museum. The Vicar (the Dean of Stamford) is anxious to continue the series. On the east wall are two large, but rather coarse, canopied niches, waiting for tenants. The Vicarage-house (well known from the illustrations in Parker's "Domestic Architecture," vol. ii., p. 242), when perfect, must have been one of the most interesting specimens of the Domestic architecture of the early part of the fourteenth century. The only part remaining is the hall, and this is so cut up by floors and divided by partitions, that its ancient character is much disguised. The fine tie-beam roof is visible in the upper chambers; and one of the side windows, of singular and beautiful tracery, remains in its place, and fragments of the others are carefully preserved. The house was probably a portion of the Priory established here by the monks of Crowland.

West Deeping has a good Decorated western tower with crocketed spire, opening into the church by a well-proportioned arch with unmoulded jambs. The church is generally Decorated of good character. In the west bay of each aisle is a charming small two-light window with an uncusped circle in the head. The tracery of the chancel windows is of rather unusual character. The nave arcades of three bays are good. The well-proportioned arches rise from cylindrical piers with well-moulded capitals. There is an old low stone chancel-screen of uncommon character, sadly spoiled by having its western face filled with poor modern mosaic work. The whole of the chancel has been subjected to a costly decorative process, with a very doubtful result. The walls of the sanctuary have been covered with gaudy tiles, and an elaborate tabernacled reredos of coloured marble and glass mosaics set up at the east end. The whole wants repose and harmony of colour, and one regretted to see so much money spent on an unsatisfactory scheme. The ancient gabled piscina and shafted sedilia, all three on the same level, and the blocked low side window are interesting features.

Tallington presented a horrifying example of a scarified interior, the joints of the random masonry, picked out with dark red mortar, looking as if huge spiders had spun gigantic cob-webs over the walls. This proceeding, however, has had the merit of bringing to light a good deal of long-and-short work in the east walls of the transeptal chapels, from which we see that the original Saxon church was cruciform, with chapels opening eastward from the transepts. The south porch rather singularly occupies the west bay of the south aisle. It has a plain shafted Transition inner doorway. There is a bell-cot, too much covered with ivy, on the east gable of the nave. The spire on the west tower was destroyed by lightning in 1760, and has not been restored.

The church at Barholm is an interesting little building, preserving its steep roofs covered with grey Colley Weston slates, without a clearstory. The lower part of the western tower is Early English. The upper story on the south side bears the date of its reconstruction, 1648, shortly before the decapitation of Charles I., with the quaint inscription:—

> Was ever such a thing seen since the creation,
> A new steeple built in the time of vexation?

The south aisle exhibits some very curious features. Within the south porch, which has a tall gable of much dignity, is a good rather late Norman doorway. Immediately to the east of this is another small blocked doorway of still earlier date, standing on a moulded plinth, on which the later Early English walls to the east have been built. In the wall above is what looks like a large plain, tall-shaped cross, but what is really probably a remnant of pilaster work belonging to the original pre-Norman building, of which the blocked door and the plinth are also relics. There is also a north arcade of three bays, with richly zigzag moulded arches rising from cylindrical shafts. The chancel arch is of the same form.

Uffington is a large and stately church, which has suffered much from over-generous benefactors, whose liberality has tempted some modern architect to indulge a taste for meretricious ornament, at variance with the simplicity of the Early English arcade of semi-circular arches rising from plain cylinders, which gives its character to the interior. Small shafts of coloured marble, rising from huge, overdone carved corbels, support the beams of a cumbersome modern roof. The pulpit is entered by a hole in the wall, and, in place of a sounding-board, has a ridiculous overhanging, concave arched canopy, heavy with executed carving. The chief feature of the exterior is the stately western tower, with a very rich West door, elaborately carved with heraldic insignia, terminated by a graceful crocheted spire, united to the tower by rather feeble flying buttresses. The date 1639 carved upon it is rather staggering. It can hardly be that of its erection, but rather of its restoration,—perhaps after being struck by lightning.

The spacious chancel has fine chantry chapels on each side, filled with monuments of various date and great interest, which we cannot now particularise. The north chantry is a very fine perpendicular design, of great loftiness and excellent proportions. The tall windows, with battlemented transoms high up on the tracery, are admirable examples of the style. The richly-groined ceiling of the west tower, with a central bell-hole, must not be omitted.

The little Rutlandshire church of Essendine, the only church visited out of the county of Lincoln, is well known for its simple Norman aisleless nave, with north and south doorways of excellent character. The chancel has been lately carefully rebuilt, preserving the old Early English features. The chancel arch was evidently reconstructed when the Early English chancel was built. The old zig-zag mouldings of the arch were reset on the original Norman piers in a pointed form. The little Early English double-gabled bell-cot on the west gable is a very picturesque feature. The church has been carefully restored at the expense of the Marquis of Exeter.

The last church visited, Cartby, was the only one of which the condition was otherwise than reputable. It ought not to be long before it is subjected to the same wholesome process of cleansing and reparation which all the others seen in these excursions have undergone. The fabric is chiefly Early English, of very good character. The arcades have semicircular arches rising from cylindrical shafts. The western tower is Early English, with a well-

* Continued from last week's *Builder*, p. 37.

proportioned broach-spire, sadly wanting an appropriate cap-stone, rising from a corbelled parapet. In the south porch is a broken holy-water stoup, and an Early English piscina in the chancel. The west tower arch rises from conical corbels of enormous size. There is a very beautiful floriated coffin-lid in the north aisle, and the church possesses many other points of interest which we have not space to enumerate. It was to be regretted that the excursion of the Society should have ended with the only uncared-for church in the whole series.

THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE annual meeting of this Association was held at Portsmouth on the 4th, 5th, and 6th of July, and was well attended by members from all parts of the kingdom, under the presidency of Mr. E. B. Ellice-Clarke, the retiring President.

The Mayor, in welcoming the members of the Association to Portsmouth, said that the pleasure of that function had been greatly enhanced by a whisper which had reached him since he had been in the room, to the effect that when the contents of the ballot-box became known his friend, Mr. H. P. Boulnois, the Borough Engineer of Portsmouth, would be elected as President for the ensuing year. He hoped that their visit would be one of great pleasure to themselves, as well as of great advantage to the public. The inhabitants of Portsmouth would be very glad to find that Mr. Boulnois had been elected President of such an important Association as that which they represented.

The annual report of the Council was then read by Mr. Charles Jones, the Honorary Secretary. In the course of it the Council again acknowledged the kind assistance accorded to the Association by the various municipal and other authorities. During the financial year ending April 30th thirty-one new members—twenty-nine ordinary members and two graduates—had joined the Association. The number on the roll of the Association at the close of the year was thirteen honorary members, 333 ordinary members, and twenty-five graduates, making a total of 371. The audited balance-sheet showed a balance in hand of £320. 11s. 5d.

On the motion of Mr. Lewis Angell the report was adopted.

The following officers were stated to have been elected by ballot to the Council: President, Mr. H. P. Boulnois; Vice-Presidents, Messrs. C. Dunscombe, T. Hewson, T. De Meade; Ordinary Members of Council, Messrs. W. B. G. Bennett, S. Brown, J. Cartwright, J. H. Cox, W. S. Crimp, J. T. Eayres, E. R. S. Escott, S. M. Fowler, J. B. McCallum, H. U. McKie, A. W. Parry, T. Walker, C. Jones (hon. sec.), and L. Angell (hon. treasurer).

A vote of thanks having been accorded the retiring President, the latter made a modest reply, remarking that he felt that whatever professional success he might have obtained in his career had been largely due to his being a member of that Association. He then, amid applause, introduced the new President (Mr. H. P. Boulnois), as one who had distinguished himself as a municipal engineer, and who was well known by his "Hand-book to Municipal Engineering." He believed that Mr. Boulnois would do the Association a great honour by being its President, and that he would form one of the many eminent gentlemen representing the great towns of this country who had been their Presidents.

The President (Mr. H. P. Boulnois) then delivered his inaugural address, in which he expressed his appreciation of the honour conferred upon him by his election, and assured the members that his best endeavours during his year of office would be devoted to furthering the interests of the Association to the utmost of his energy and ability. Looking back upon the names of the gentlemen who preceded him during the sixteen years of the existence of the Association, he felt that the task he had undertaken was not easy of accomplishment. He should, however, by every exertion in his power, endeavour to maintain the high position which the Association now held, and if it was possible by any efforts of his and by their assistance to still further raise it in the estimation of the public, they might rest assured that he would strive to do so. Looking through the fourteen back volumes of the "Proceedings," he found that no fewer than fifty-six papers had been read and discussed upon the general subject of drainage and upon questions connected with the disposal of sewage. All the papers contained most important and valuable information, and in many cases were descriptions of works designed by and carried out under the superintendence of those members who had prepared and read the papers. Upon subjects connected with sanitary legislation, and the work of the Public Health and other Acts, so far as they affected the Town Engineer or Surveyor, twenty-seven papers had been read and thoroughly and ably discussed. Upon that very debatable and much-disputed question,—the ventilation of sewers,—five papers had been read, which contained some of the best and most reliable information ever published upon that most important subject. Fifteen papers had been read upon the question of the water supply of towns; the lighting of streets both by gas and electricity had been dealt with in ten papers. There had been fifteen papers upon streets and their construction; upon house drainage, and the sanitation generally of the dwelling-house, thirteen papers had been given to the Association. The construction of street tramway lines of numerous descriptions had been considered in seven papers, and there had been seventeen papers upon miscellaneous subjects of a most interesting character, in addition to eighteen papers giving minute descriptions of public works which had been visited by members of the Association. This was a most creditable record, but, at the same time, it fell far short of any adequate epitome of the real amount of useful work which was daily and hourly being carried out by members of the profession throughout the country. There were upwards of 1,000 gentlemen eligible for enrolment as members, and yet their actual number was only 371, and only seventy-one of that number contributed papers. There still remained a vast storehouse of knowledge, to be gained only by constant work and experience, upon most of the subjects which had been dealt with at their meetings. The question of the profitable disposal of water-carried town sewage still remained unsettled; the most effective method of sewer ventilation was still another active bone of contention; whether we should have public and private lighting by electricity or remain contented with gas, had by no means yet been settled either by experts or by the *vox populi*; it was still a debateable question whether wood or asphalte made the best surface wherewith to cover their roadways; the practical working of many of the clauses of the Public Health and other sanitary Acts, was not all that could be desired; and there were not many sections of the comprehensive Public Health Act (1875) which could not be well discussed at considerable length, and in fact there was no lack of subjects for papers. The abatement of the smoke nuisance and the consequent diminution of thick fogs was a very difficult problem to solve without a considerable alteration in the habits of the people. The avoidance of that irritating and injurious noise caused by the great traffic of their streets, whether it was to be cured by improved movements or improved wheels and horses' shoes, or both or neither, time would show. The better housing of the working classes had still a future, notwithstanding the great strides that had been made during recent years. That unostentatious but necessary work, the collection and disposal of house refuse, was at present by no means perfect, and was susceptible of improvement. The present arrangement for the laying of gas and water mains was by no means satisfactory, and the removal of the unsightly, and sometimes dangerous, overhead telegraph and telephone wires to beneath the roadways or footwalks, would not be satisfactory unless special means were provided to avoid the necessity of breaking up the surface for repairs or connexions, &c. The rapid growth of these necessities of civilisation, and the addition of hydraulic pressure mains, steam-pipes from central stations, and the feasibility of gaseous fuel similarly laid on, would before long necessitate legislation in that direction. Speaking for a moment upon the subjects which would engage the attention of the Council during his year of office, an examination for pass-certificates was, he believed, daily growing in popular favour; and the proposed registration of the Association could but add to the value of those certificates, which were only gained after a most rigid test. He hoped at some future time to welcome them again to Portsmouth, when he should be able to give them a paper setting forth the details of the working of this last departure. In conclusion, Mr. Boulnois said he believed that the Association of which he had had the honour that day of being elected President was daily increasing in strength and importance, and that the branch of the profession to which they belonged was daily growing in popular favour and esteem.

On the motion of Mr. Lemon, seconded by Mr. Angell, a vote of thanks was accorded the President for his address.

It was resolved, on the motion of Mr. Angell, that the Association should be registered under the Companies' Act, and a committee of five members was appointed, with full powers to carry the aforesaid resolution into effect.

Mr. Francis Newman, C.E., Borough Engineer, Ryde, I.W., read a paper entitled "The Relation of Local Authorities and their Surveyors to Improvements in the Sanitary Arrangements of Existing Buildings." In the course of this paper the author said:—"In new buildings the Surveyor can enforce a definite system of drainage, and particular arrangements for ventilation and disconnexion, as well as specific apparatus for water-closets; he has not to convince any one that his opinion on sanitary principles is correct, but has merely to enforce the execution in a workmanlike manner of the work as described in the by-laws; on the other hand, in reference to existing buildings, we have to show that the arrangements provided 'are not sufficient' or that the premises, are, owing to such arrangements, 'in such a state as to be a nuisance or injurious to health,' and in the generality of cases to convince magistrates of the soundness of our conclusions. I presume the sections of the Public Health Act under which sanitary authorities most frequently deal with the arrangements of existing buildings are:—23. 'Power of local authority to enforce drainage of undrained houses.' 36. 'Power of local authority to enforce provision of privy accommodation for houses.' 91 to 103. Dealing with nuisances. The work empowered to be done under sections 23 and 36 may, in default of compliance with notice, be executed by the sanitary authority, and the cost recovered from the owner; but proceedings in reference to the nuisance sections are more cumbersome, and defects that can only be dealt with by those sections are frequently of the greater importance. . . . I think, in dealing with existing houses, it will be found advantageous to treat them, as far as practicable, as we should new buildings, and I regret very much that a measure was not passed prior to the introduction of the County Government Bill, which would have enabled authorities to apply the same rules to both new and old buildings. Such a measure might have included the removal of other stumbling-blocks in the way of sanitary administration, and would not have occupied a tithe of the time devoted to the bill above named. There is, however, one way of helping ourselves in this matter, which I think has been lost sight of by many. Our excellent President told me some years ago that he had drafted a by-law, which had received the sanction of the Local Government Board, with reference to drains forming new connexions with the sewers, even although not intended for new buildings; and the Town Clerk of my borough drew my attention not long since to sub-section 4 of section 157, which enables a Sanitary Authority to make by-laws with reference to the drainage of buildings, the restriction of this power to make by-laws to new buildings only, which appears in the prior sub-sections, is omitted from this; this seems to have escaped the notice of the Local Government Board, as no model by-laws have been issued by them applicable to the drainage of existing buildings. And I think it would be well if localities would submit such by-laws to the central Board, and endeavour to obtain their sanction thereto; such by-laws might, with great advantage to the profession, be drafted by the Council of this Association. I have before alluded to variation in the practice in dealing with the sanitary arrangements of existing buildings. I think there is another way in which the practice in this department varies, and that is that the defects are often dealt with by the Medical Officer of Health and the sanitary inspector without the intervention of the Surveyor; and I suppose we should all be

strongly of opinion that all works of a structural character, or involving mechanical appliances, whether executed by a local authority or supervised by its officers, should be controlled by the Surveyor's department, and that if so controlled the practice in different towns would be more uniform. Now in dealing with defective houses I have found one difficulty which would not arise were it clearly laid down that what are good and reasonable precautions in new houses, built under some public supervision, with precautions against damp walls and damp floors, are also good and reasonable for existing buildings which may not have been built with such care; the difficulty I refer to is that magistrates will generally only make orders to do the minimum of work. In going before a Court, in order to ensure getting an order, it is often necessary that evidence should be given to show that the improvements are absolutely required, and that without such improvements the premises are injurious to health. In practice we are accustomed, in devising works of house drainage and arrangements connected therewith, to provide safeguards, which, although wise precautionary measures, it is sometimes difficult to prove that they are all absolutely necessary, and that injury to health will result from the omission of any part of them. Take, for instance, the disconnexion of drain from sewer, and the provision of an air inlet on the house side of such disconnexion. On a house which has the wastes disconnected, the inlets to drain all properly trapped, and the soil-pipe placed at the farthest point of the drain from the sewer, and carried a suitable height above the roof for ventilation, this drain might be trapped near its entrance to the premises, but without an air inlet on the house side of it. In this case the ventilation-pipe would relieve the traps from pressure, though there would not be a current of air through the drain and soil-pipe, which we think desirable to constantly change the air in the drain; or the drain may not be trapped from the sewer, in which case air will pass from the sewer through the drain and ventilation-pipe; still the latter will relieve the traps from pressure. The Local Government Board have recognised the value of this extra precaution and of the system of double disconnexion generally; but can it be maintained that the absence of double disconnexion causes a house to be in such a state as to be a nuisance and injurious to health? There then follows another question: if the greater perfection of sanitary arrangements cannot be enforced is it expedient to give notices requiring them, or simply to limit the notice to such works the omission of which there is no difficulty in proving are injurious to health? It appears to me that the drainage and other arrangements of existing buildings which need amendment may be divided into two clauses. 1. Those with drains of improper material or of such gradient as to cause deposit, or drains with the collars of the pipes broken off, and connexions made by cutting holes in the pipes, with inside soil-pipe or traps pierced with holes, scullery, and other sinks or cellar grating in direct connexion with the drain, water-closet cisterns supplying drinking-water, drain not ventilated, or some of these defects. 2. Those which, although having a fair drain, scullery, and other wastes disconnected, and the drain ventilated, have defective closet apparatus, the soil-pipe within the house, and the house-drain not disconnected from the sewer. With the first class it is comparatively easy to deal; with the second it is less simple, because, as before stated, it is difficult to prove the absolute necessity of perfection in such matters. I have before referred to the practice in some places of the authority taking action only on the report of the officer of health or the sanitary inspector, and I have known cases in my own borough where notices have been given, on the report of one of those officers, to disconnect the scullery-sink: those scullery-sinks have been disconnected, and I have afterwards had occasion to examine the buildings and open the drains, and have found that whereas prior to the disconnexion, the scullery waste ran into a brick drain under the sink, which brick drain traversed the scullery and some other part of the building, disconnexion, as carried out, simply meant that a trap was put outside for the waste discharge, such trap being disconnected with the old brick drain under the building. Now with reference to the designing the improvement of the sanitary arrangements in existing houses, it appears to me very advantageous that all these alterations should be done under the Surveyor's direction; but I do not think it right that owners of property should expect the local Surveyor to design these alterations for them, but rather that they should submit a plan to him which he will examine and give his opinion on; and if satisfactory, they will carry out such a plan under his superintendence, as all such work should be superintended by a public officer. The difficulty that arises on this question seems to be this, that an owner of property who removes defects voluntarily is placed at a disadvantage as compared with he who waits until the authority compels him to make the improvement; as the former has to engage the services of a professional man, whilst in the latter case the Surveyor sets out in the notice what is required to be done. Having just referred to the subject of inspection of work in progress, I would say that it appears to me most advantageous to the public that every house drain should be inspected by a public officer before the joint-holes are filled in, its joints examined, gradients tested, and a plan taken, which plan should be put upon the town map, if that map is of not less scale than $\frac{1}{500}$; but inasmuch as there is not sufficient space for the inspector to initial the map and place the date of the execution of the work, I have adopted the plan of having an inspection book, in which the portions of the drains inspected are entered day by day,—a tracing showing the plan of the drains being pasted in the book, and the initials of the inspector, together with description of the gradients and ventilation of the work, being attached to the plan renders the discovery of alterations comcomparatively easy. There is another point, and that is the disposition of tenants to seek the intervention of the authority to get something done by their landlords which they are unable to secure themselves; this, I think, is perfectly legitimate if defects arise after the tenancy has commenced, or if a state of things exists which was thought fairly good at the commencement of the tenancy, but which has become obsolete when the interference is sought; but I have known cases where persons, perfectly able to pay a fee for professional advice before taking a house, within six months after entering into occupation, call upon the local Surveyor to put pressure on the landlord, either by reporting to his committee, or by personal action, to induce such landlord to make improvements which the tenant should have required to be done before he entered into occupation. In some towns, particularly watering-places, the system of granting certificates when houses are in a good sanitary state has been put into practice. I have myself thought the system might be used as an inducement to owners to put their houses in order, but I confess I have found many difficulties connected with it; one conclusion I have arrived at is, that such certificate ought to give full particulars of the arrangements, so that alterations or defects subsequently introduced under bad advice may be easily detected. I have found that where a drainage system was provided with disconnecting trap and air inlet, and an exit for the air through the soil and ventilation-pipe which was outside the building, such exit had three years afterwards been stopped by a trap being introduced at the foot of the soil-pipe, because the owner complained of a smell from the water-closet, which, by the way, was of the old pan and iron container type, and which was removed before I saw the house the second time. There is one point to which I wish to refer,—one which I doubt not all those gentlemen whose sphere of duty lies in towns which have had drainage more than thirty years are too familiar with,—namely, those drains the responsibility of maintaining which is legally on the authorities, but morally on two or more owners: I mean joint-branch drains used by two or more houses, which, but for the interpretating clause of the Public Health Act, no one would deem public sewers. It appears to me it is for the interest of sanitary progress that Authorities should at once recognise and accept their responsibilities, treat these drains as sewers, and reconstruct them where necessary and provide means for their ventilation; that Authorities should, in fact, lead sanitary improvement. There is one other point of interest on the question of these drains to which I would refer: supposing a drain taking the drainage of two houses, and, therefore, legally a sewer repairable by the Authority, ceases to take the drainage of one of the houses, does it cease to be a sewer?"

After some discussion the members adjourned for luncheon, after which the following papers were read,—viz., on "Portland Cement," by Mr. W. Santo Crimp; on "Sewer Ventilation," by Mr. Archibald H. Ford; and on "Electric Lighting," by Mr. E. J. Silcock. To one or two of these we may possibly return on a future occasion.

The annual dinner of the Association was held on the evening of the first day.

The second and third days of the meeting were mainly devoted to visits to H.M. Dockyard and to the new Portsmouth Waterworks at Havant.

HOLY TRINITY CHURCH, CORK.

THIS, writes a correspondent, is the church referred to in Thackeray's "Irish Sketch Book":—

"On the road is a handsome Roman Catholic chapel, or a chapel which will be handsome so soon as the necessary funds are raised to complete it. But, as at Waterford, the chapel has been commenced and the money has failed, and the fine portico which is to decorate it one day as yet only exists on the architect's paper."

About three months ago the Father Mathew Centenary Committee issued a circular to some of the leading architects practising in Ireland, about twelve in number, Catholic and Protestant alike, but all more or less identified with ecclesiastical architecture, inviting them to send in designs for the façade of this church, which it was proposed to complete as a memorial to the Apostle of Temperance. From the twelve designs—the identity of the authors being distinguished by a motto or *nom de plume*—submitted, three were selected for further competition, the authors being required to furnish all the work, drawings, and other requirements necessary for the perfection of the building contract, for which each was rewarded with the *honorarium* of 50*l*., the author of the design finally selected by the committee being chosen as the architect of the work. The successful competitor in this case is Mr. Walter G. Doolin, M.A., of Dublin, who has circulated amongst the building committee an explanatory statement descriptive of his design, from which some of the following particulars are extracted. He admits that the conception of the Messrs. Payne, the architects who more than fifty years ago began this church, is in its way a fine one, and has founded on its main idea his own design, which is English Gothic of a late Perpendicular type. The façade consists of a portico of three arches the full height of the nave, with screens of sculptured stonework at the base, having niches, containing the patron saints of the southern provinces, with a glory of early Franciscan saints and martyrs. Over the main gable rises the tower, which is in three stages, crowned by an octagonal spire. The architect provided for all the work being done in County Cork limestone, and wrought within the city. The estimated cost of erection is 6,000*l*. Mr. G. C. Ashlin, R.H.A., acted as referee or consulting architect to the committee.

THE ROYAL ACADEMY:

ADMISSIONS TO THE ARCHITECTURAL SCHOOL, JULY, 1889.

MR. R. PHENÉ SPIERS, the Master of this School, sends us the following lists:—

Students: Upper School.

A. Mackintosh.	J. C. Watt.
L. Martin.	

Students: Lower School.

A. W. Hoskings.	W. S. Taylor.
W. C. Howgate.	A. F. Usher.
H. E. Kirby.	H. A. Woodington.

Probationers.

C. W. Baker.	R. A. Reid.
C. Bywater.	P. D. Smith.
A. J. Edwards.	J. S. Stewart.
E. J. Gibson.	G. Streatfield.
S. M. Herbert.	H. Tooley.
R. S. Lorimer.	A. B. Yeates.
H. L. Paterson.	

Sale of the Grove Estate, Wanstead.—The sale of the first portion of the Grove Estate, Wanstead, took place on the 11th inst., and attracted a very large attendance of buyers. The sale was conducted by Mr. G. F. Morris, of the firm of Protheroe & Morris, under a marquee on the premises. We understand the whole of the plots were sold.

Illustrations.

DUNSTABLE PRIORY CHURCH:

PART OF WEST FRONT.

DUNSTABLE Priory Church was founded by Henry I., the charter being drawn up soon after 1131. The fine, impressive late Norman work of the nave may safely be dated at a year or two after this,—viz., 1132 or 1133. The nave is all that remains of the original Norman church, there being now no choir, transepts, or central tower. Of the priory and its buildings only a basement remains. The original west end (the last part of the church which was finished) is Transitional in style. Of this Transitional work all that now remains is the large central west door, with its magnificent and elaborately-carved semi-circular arch, together with the right half of a second and smaller semi-circular arch to the left, beneath which are one or two intersecting arches of the same date and identical in design, or almost so, with the remarkable series of intersecting arches in the "slype," on the south of the south transept of St. Albans Cathedral. The semi-circular intersecting arches spring from richly-carved capitals, as they, without doubt, originally did at St. Albans. The original splendour of the western doorway at Dunstable can be well inferred from our illustration; all the carved work was originally deeply undercut, and this delicate hollow work has always attracted birds for nesting purposes The birds, in turn, have had a strong attraction for boys, and heavy stones have in past times been thrown up to dislodge birds'-nests and eggs, the consequence being that very little of the old carved work is now left intact. There is, however, sufficient carving left for a drawing of a restoration of the original carved designs, and we may return to this subject at some future time. The supporting capitals are all *in situ*; these are mostly carved with figure subjects in the best style of Transitional art. The shafts have all vanished except two, as shown. Other pieces of shafts are built into an adjoining wall. Over the capital of the shaft to the extreme left is a bust (apparently of a King), and said to be Henry I., the founder. The remains of three other busts occur over the extreme right and the two inner capitals. The grand Early English door to the left opens into the present tower; the two tiers of arcading above are equal to any of the work at Westminster Abbey or St. Albans; the diaper-work on the surface reminds one strongly of Westminster. All the Early English work at Dunstable is of the best and finest character. The two windows over the central door light the nave. The Early English work inside these windows is very fine, and reminds one of the original work within the three porches at the west end of St. Albans. The small door (seen in the fifth opening from the left of the upper arcade) is reached from the south side of the nave below, and the open arcade passage leads to the staircase of the tower turret to the left. The large central door is filled in with Early Perpendicular work: this might have been inserted to prevent the collapse of the great arch, for parts of the church have in old times fallen in. Numerous sculptured figures must have embellished this front at one time, for in the portion illustrated there are niches and pedestals for no less than fourteen figures, and the lower portion of one figure still remains *in situ*,—seen at the bottom left of our plate in the buttress. In every instance the courses of the masonry show where work of different periods coalesce. A few years ago the tower was entered from outside over a stone coffin; this coffin has now disappeared. The church was well restored some years ago by the late Mr. G. Somers Clarke. Our illustration is from a drawing made by Mr. Worthington G. Smith, of Dunstable.

"THE KULM," BEARSTED, KENT.

THIS house has recently been built on an elevated site commanding a delightful view over the North Downs, with the ivy-draped church and village of Bearsted lying in the middle distance, surrounded by hop-gardens. On the south-east front a broad terrace with concrete retaining walls has been constructed on the hill-side, and contains in front various out-offices, such as potting-shed, tool-house, &c. A Canadian wind-mill which pumps the water from a well for domestic purposes forms a conspicuous but not unsightly object in the rear of the house. These works, with the sewerage arrangements and laying-out of the site generally, were completed prior to the erection of the house under the direction of the proprietor, Dr. Adams, of Maidstone.

The arrangement of the house, as regards the ground-floor, is shown on the plan given with the accompanying views. The accommodation of the upper floors consists of eight bedrooms, dressing, bath, linen, and box-rooms, and w.c. The basement contains larder, wine-cellar, store-cellars, and heating apparatus.

The walls, where not covered with tile-hanging, are faced with local red-pressed bricks, and the roof is covered with red tiles. Red Californian pine has been used for the panelled ceilings of dining-room, library, and hall, and for much of the internal joinery, yellow pine being employed in the more exposed positions. Wood block flooring of simple pattern, in oak and jarrah wood, has been laid in the hall and library.

The house has been built without contract, at a cost of about £1,600, by Mr. George Ansett, builder, of Maidstone, from the designs of Mr. John Langham, architect, of Manchester.

GLOUCESTER MUNICIPAL BUILDINGS COMPETITION.

WE give this week perspective views of the second and third premiated designs in this competition, by Messrs. Medland & Son and Mr. J. Fletcher Trew respectively, and also the perspective view of the design submitted by Messrs. Giles & Gough, which we referred to in our article on the competition as the best drawing in the room. For this reason we have given it on a larger scale than the two premiated designs, which, architecturally, it must be confessed, present but very meagre interest, and which probably owed their position in the competition mainly to merits of plan.

The plans of all three designs exhibit good points, and we have given the principal floors of each, side by side, for comparison.

Beyond this it is unnecessary to add anything to the remarks we have already made on the various designs.

THE LATE SIR JAMES PICTON.

WE record with much regret the sudden death of Sir James Picton, F.R.I.B.A., F.S.A., which occurred on Monday evening last, at his residence, Sandyknowe, Wavertree, Liverpool, after a few hours' illness. According to a biographical notice in the *Liverpool Daily Post*, he was born in Liverpool on Dec. 2, 1805, and he was therefore in his eighty-fourth year. He was the son of a timber merchant, Mr. William Picton, who had migrated to Liverpool from Warrington, in which town or its neighbourhood several generations of the family had lived. Young James Picton was sent to a school kept by a Mr. Prior, but his school-days were brief, for a little after he was thirteen years of age he entered his father's office, and became bookkeeper. It is stated that he threw himself into this dry business work with as much energy as that which characterised his more congenial studies of antiquarian matters in later years. After the termination of his father's business career, the deceased was thrown upon the world at a very critical period, between boyhood and manhood, without any technical knowledge of a trade or profession, and without any patronage to secure him an opening. At this time two very diverse situations were offered, one in a venetian-blind business, the other in the office of Mr. Daniel Stewart, architect and surveyor. As everybody knows, he accepted the last-named offer, and it is stated that he quickly adapted himself to strange circumstances, and became exceedingly valuable to his employer. He married at an early age. To support his position he had to make great efforts, and to encounter an immense amount of work. He was in the habit of leaving his home at two or three o'clock in the morning, when he would get through a piece of surveying in the country, and would return in time for ordinary office work at nine o'clock. He would carry on his usual duties the whole day,—and business hours were much longer then than now. Then he would sit up the greater part, or occasionally almost the whole, of the next night to work out the figures he had taken the previous morning, and to write his report. By this means he made himself so valuable as to become a necessity of the business. He identified himself with it, and when Mr. Daniel Stewart retired, he succeeded both to his house and office, which were situate at the corner of Russell-street and Warren-street. But as the professional work now rapidly increased, a removal was necessary to the more commercial part of the town. The period of palatial office buildings was just beginning, and his business-like grasp of practical needs, together with his clear-headed faculty, made him very successful in the arrangement of plans. At the same time, he thoroughly understood the peculiar adaptability of Italian architecture to commercial needs. The result is seen in Fenwick-chambers, Tower-buildings, the Corn Exchange, Brown's-buildings, and others. Sir J. Picton's clear style of writing and his power of lucid exposition stood him in good stead as a surveyor, and when it was found that he could not only express well the grounds of an opinion, but could bear with imperturbable composure any amount of cross-examination upon the subject, his services in railway business became very highly valued. In the complicated questions arising out of compulsory acquisition of land for public purposes he was for many years recognised as one of the highest authorities in the country. Our space is too brief to mention at length Sir James Picton's public services to his native town, where his name will be perpetuated by the Picton Reading Room, in which is a brass plate bearing the following inscription:—

"This building, erected by the Corporation of Liverpool, was by resolution of the Council, dated 6th October, 1875, ordered to be named the Picton Reading-room, in recognition of the valuable services rendered by James Allanson Picton, Esq., F.S.A., in his capacity as chairman of the Public Library and Museum and Gallery of Arts Committee, which he has occupied for a period exceeding a quarter of a century."

His labours as an antiquary and writer are well known, one of his latest works being entitled "Memorials of Liverpool." He was the author of a large number of other works, including numerous papers read before archæological and other societies. Many of these have appeared from time to time in the columns of the *Builder*. He was knighted a few years ago (at the instance of Mr. Gladstone) in recognition of his services to his native town. Active in mind and body to the last, his death has evoked the warmest expressions of regret from public men and public bodies, the flags of the public buildings in the city being raised half-mast. We understand that the funeral is to take place on Saturday afternoon next, at Smithdown-road Cemetery.

LECTURES ON ARCHITECTURE.

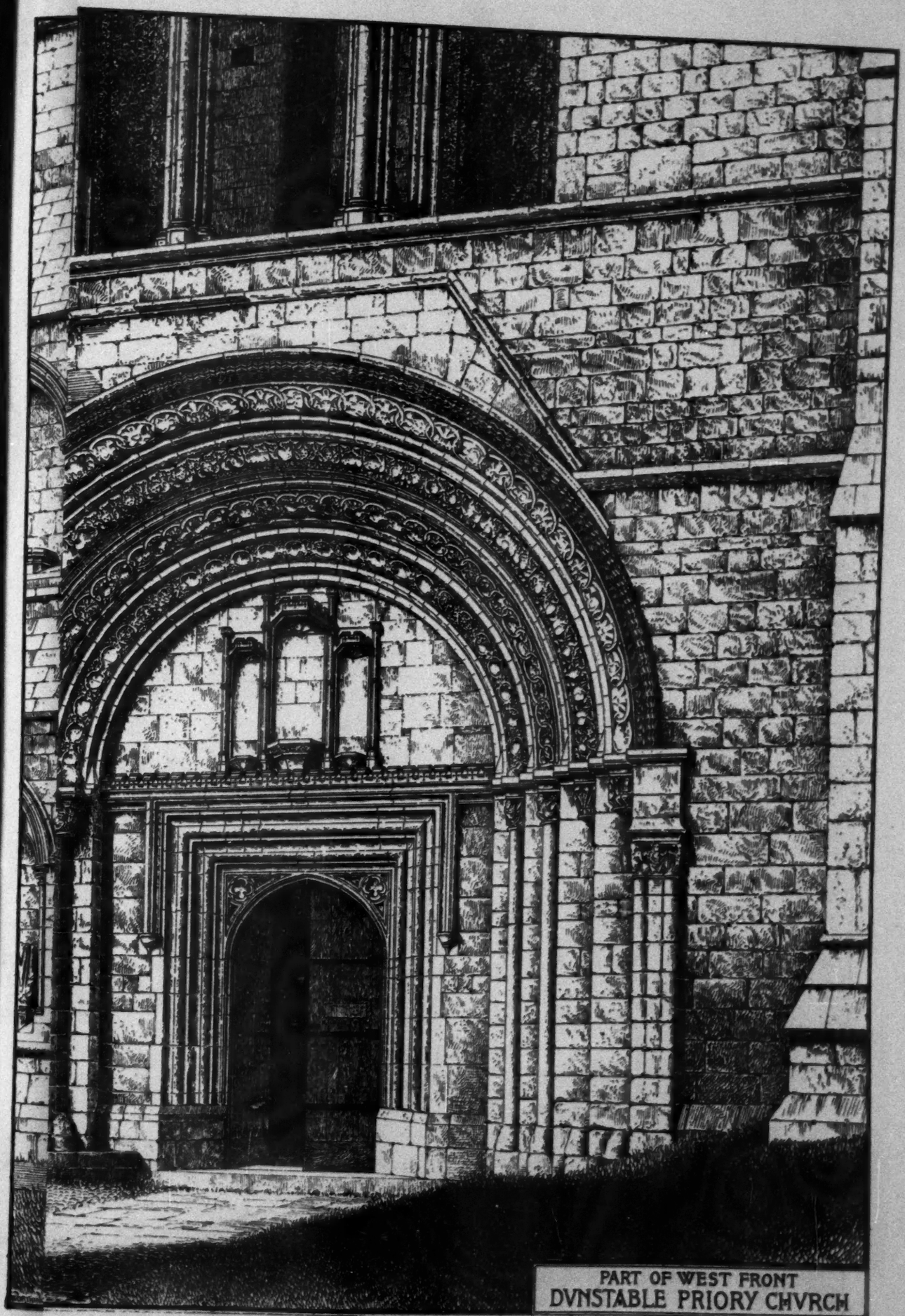
THE following is the result of the examination held at the Central Institute, South Kensington.

The first prize given by the Worshipful Company of Carpenters was gained by Mr. A. B. Yeates, with 241 marks out of a possible 270.

The second and third prizes given by the lecturer, Mr. Banister Fletcher, were gained by Mr. A. Hale, with 213 marks, and Mr. A. Corderoy with 199 marks.

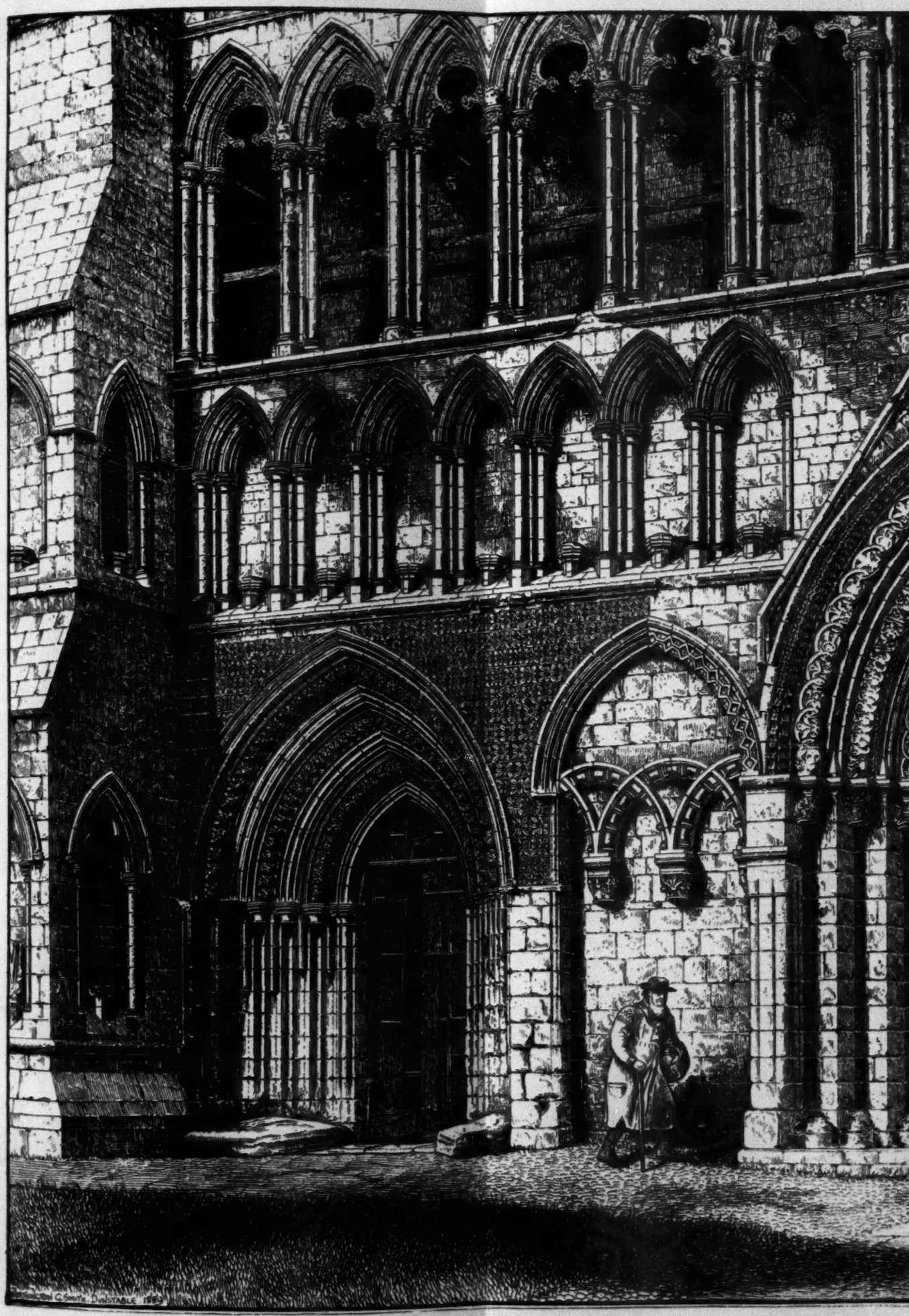
The following obtained first-class certificates:—Messrs. D. A. Ross, R. T. Hughes, H. G. Leslie, A. E. Mullins; and the following second-class certificates:—Messrs. H. P. Fletcher, G. J. Carruthers, J. Baddock, H. S. Cregeen, H. H. Knight.

Roman Remains in Algeria.—According to a recent report of the British Consul-General at Algiers, the opening-up of Algeria by railways has had the effect of rendering easily accessible many interesting Roman remains which formerly could only be reached with much difficulty and fatigue. "Those going from or to Biskra must pass through Butova, about half way between Biskra and Constantine, and a centre from which numerous excursions may be made. One of exceptional interest, at a distance of about five hours' drive, is the ancient Roman city of Thamugus (modern Tunegad), which has been entirely unearthed, and is nearly as remarkable as Pompeii. Fortunately being situate in a district far removed from European residents, there has been no temptation to destroy its monuments, or remove its stones for building purposes. Another line just opened in the department of Constantine is from the Station of Souk-Ahras, the country of Surat Augustine, southwards to Tebessa, where are some of the finest Roman ruins out of Rome."



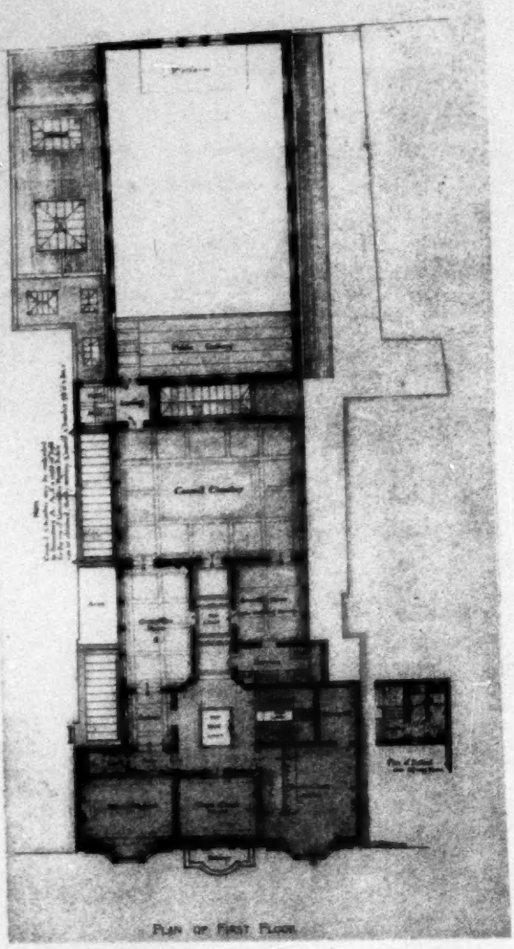
PART OF WEST FRONT
DVNSTABLE PRIORY CHVRCH

PHOTO-LITHO. SPRAGUE & CO. 52, HARTING LANE, HATTON GT., LONDON, E.C.

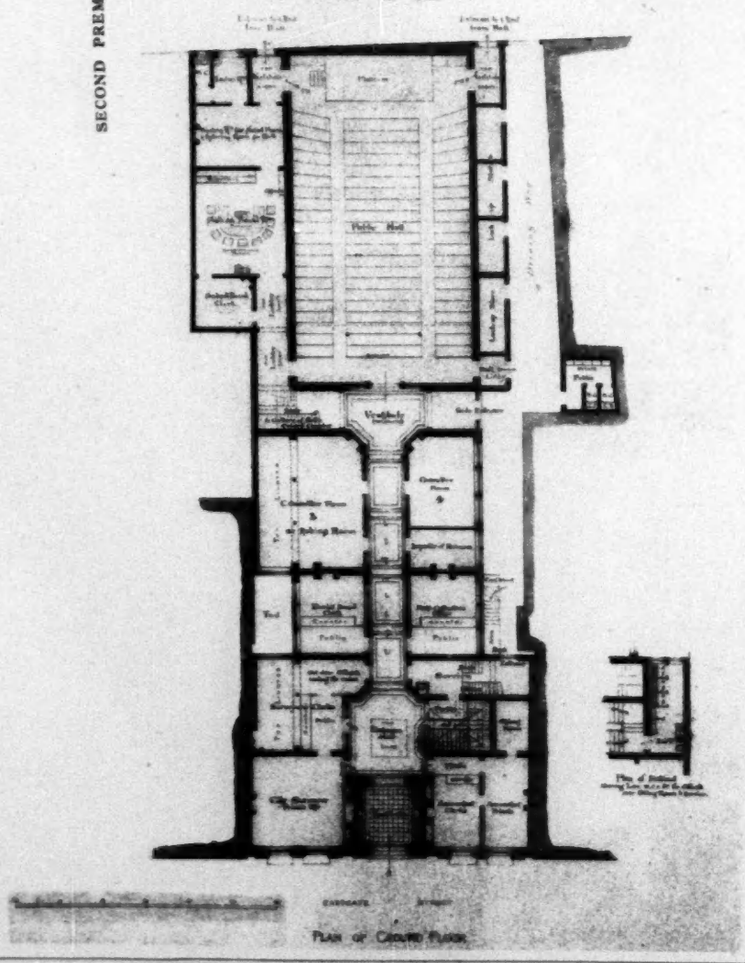


PART OF WEST FRONT
DVNSTABLE PRIORY CHVRCH

SECOND PREMIATED DESIGN.

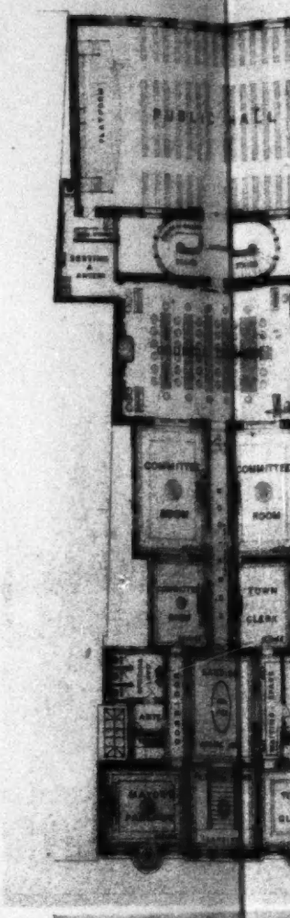


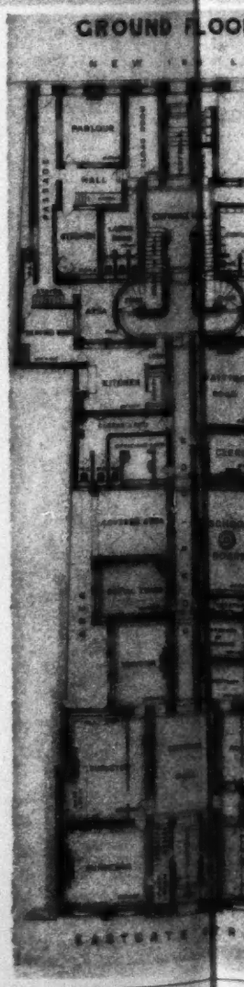
PLAN OF FIRST FLOOR



PLAN OF GROUND FLOOR

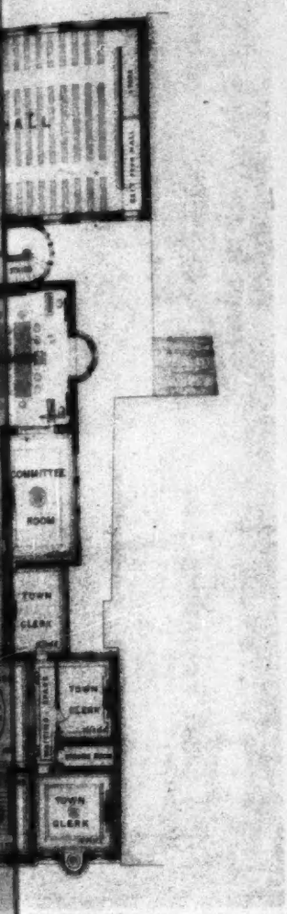
THIRD PREMIATED DESIGN.



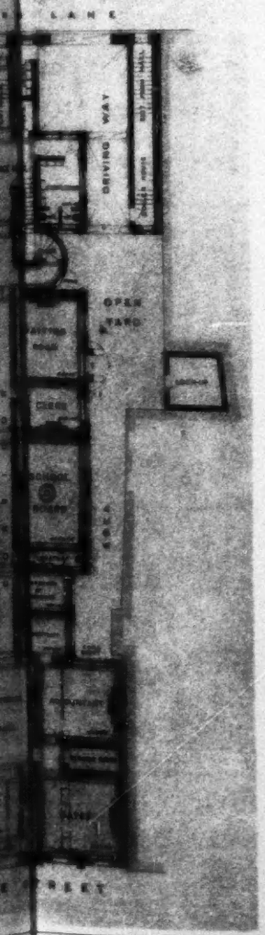


GLOUCESTER MUNICIPAL BUILDIN

LOOR PLAN

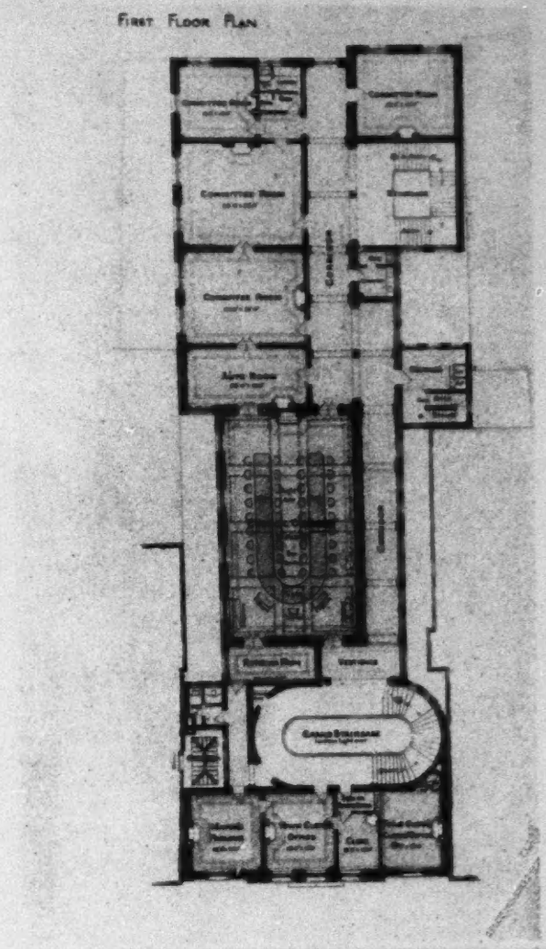


FLOOR PLAN

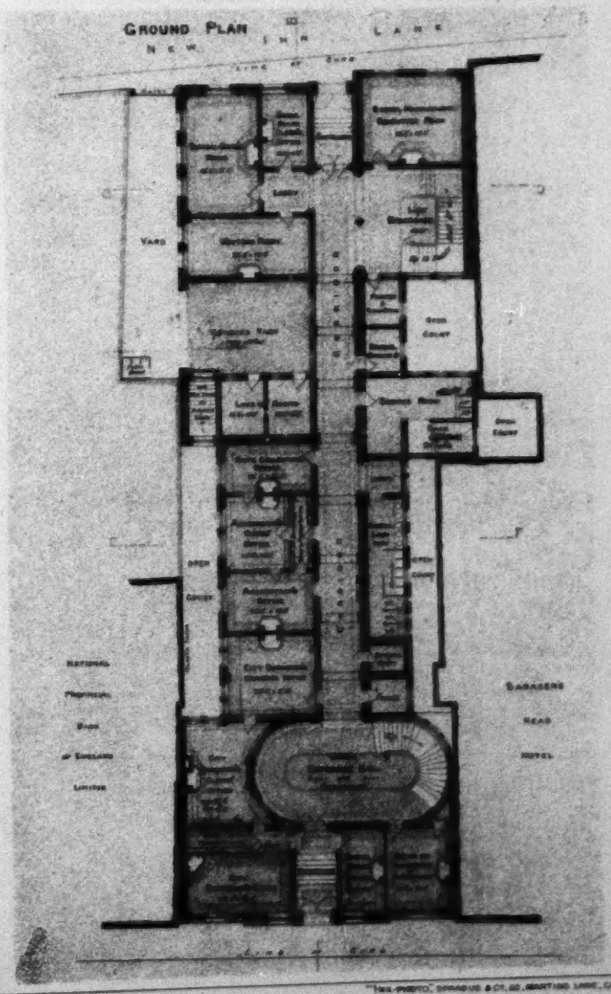


DESIGN BY MESSRS. GILES & GOUGH.

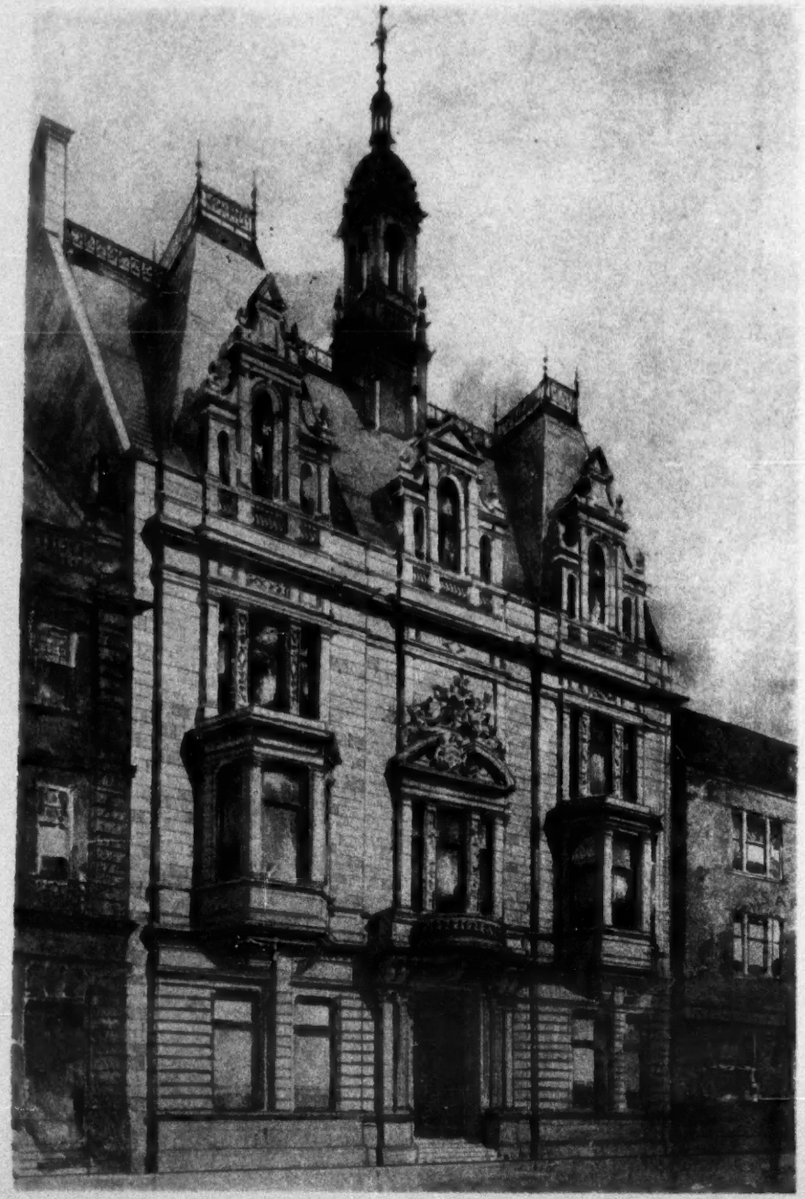
FIRST FLOOR PLAN.

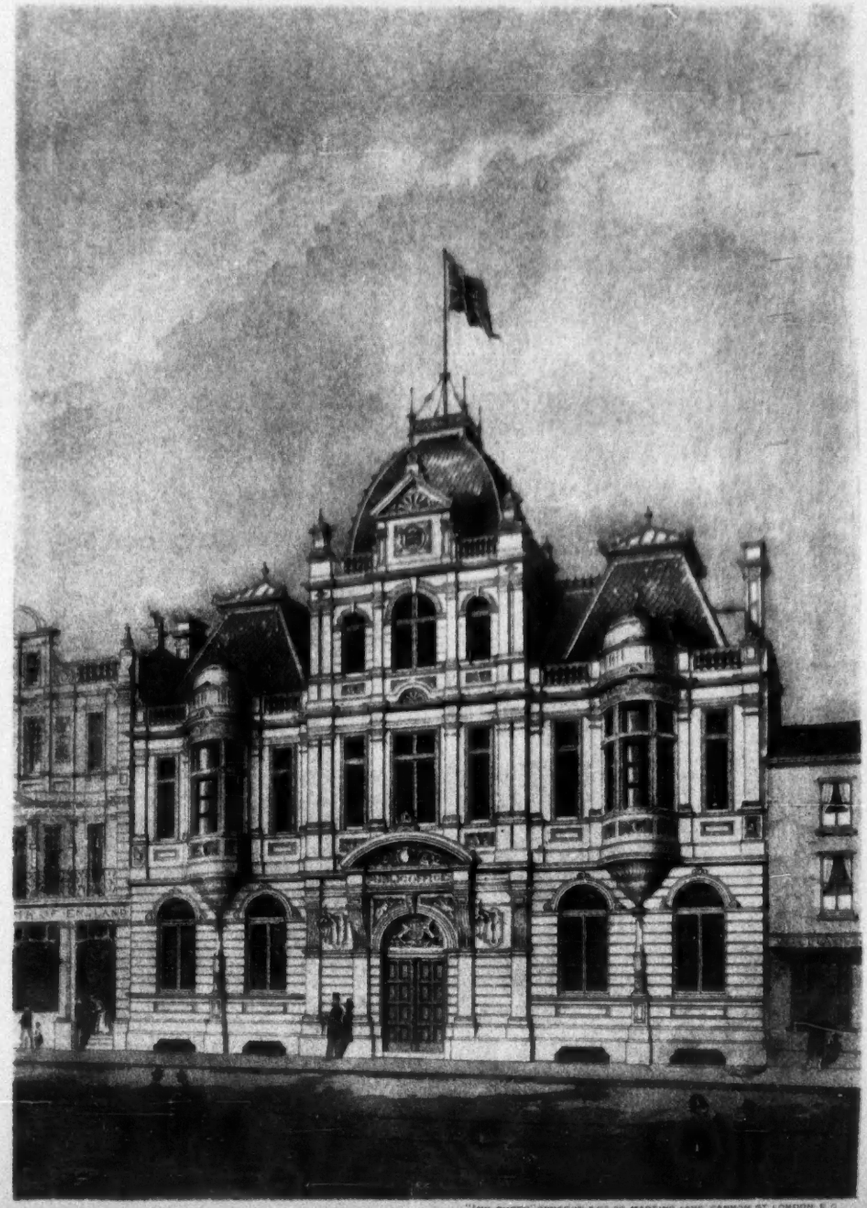


GROUND PLAN



BUILDINGS COMPETITION.—PLANS.





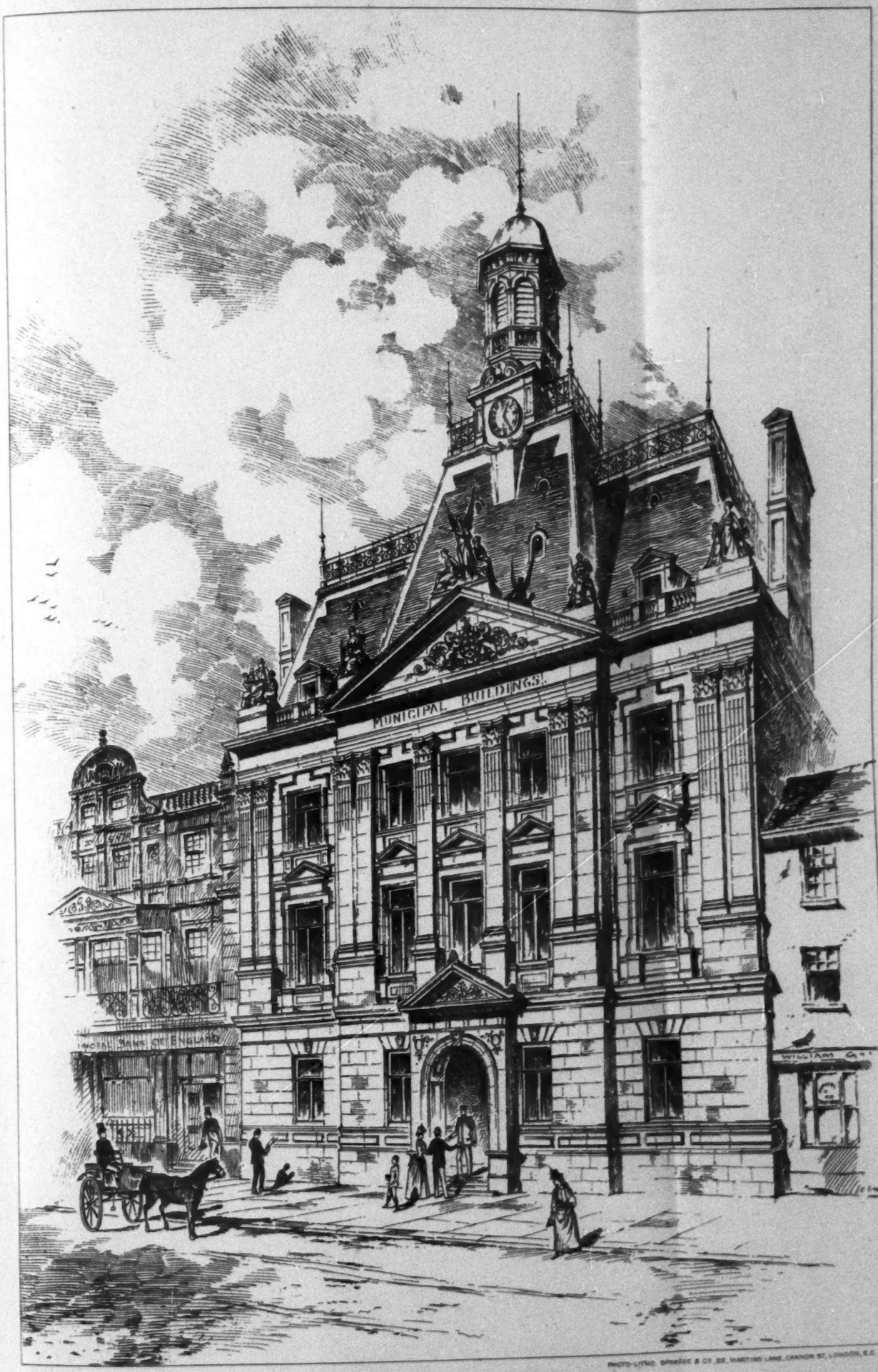
SECOND PREMIATED DESIGN.—MESSRS. MEDLAND & SON, ARCHITECTS.

THIRD PREMIATED DESIGN.—MR. J. FLETCHER TREW, ARCHITECT.

GLOUCESTER MUNICIPAL BUILDINGS COMPETITION.

Terrace
'THE KULM' BEARSTED KENT
built for Dr Matthew A Adams
J Cunningham Archt

THE KULM
EARSTED. KENT
built for
M.A.ADAMS
1888.
Architect
Manchester



GLOUCESTER MUNICIPAL BUILDINGS COMPETITION.

DESIGN SUBMITTED BY MESSRS. GILES & GOUGH.

ARCHITECTURAL ASSOCIATION VACATION VISITS.

THE fourth vacation visit of this Association was made on Saturday last to the house of Mr. Hubert Herkomer, A.R.A., at Bushey, when a large party of members attended, and not only enjoyed the study of beautiful handicraft, but learnt many valuable lessons in artistic principles from the conversation of the genial professor. The visitors were received by Professor Herkomer in his studio, a temporary structure which, until the erection of the house now in progress, serves, not only as a painting-room, but is also at once the chief living-room and the repository of the furniture which has been prepared for the future home. From this furniture Professor Herkomer illustrated the first principle the visitors learnt, that nothing should exist as furniture in a home simply for ornament alone, but that the utility of each object as an article of domestic use should be the primary consideration. Hence everything seen had its purpose,—writing-table, settles, bookcases, and cupboards for various necessities. The furniture, as also all the appointments of the house, have been designed, and much of the work executed, by Mr. Herkomer himself. In this way that unity of thought and motive which is so essential to complete artistic effect is maintained. The style adopted throughout is that of the late German Gothic,—appealing, as it does, to the national feeling of the Bavarian artist-owner, and lending itself to infinite richness of ornament and variety of design, both in wood and metal. A notable feature of the furniture is the large provision of cupboards, for, as Professor Herkomer said, "We are a very tidy people, and, in order to maintain tidiness, you want plenty of cupboards in which to put things away." Hence the books are put in cupboards, and proof engravings mounted in frames are also in cupboards, not only for the sake of tidiness and their preservation, but to avoid the unpleasant effect of staring white paper on the walls. Leaving the studio, the visitors were next shown the workshops, around which the house is being built, and which have consequently been planned with a view to their incorporation in the finished structure. Here were seen the smithy, at which so much of the beautiful ironwork produced by the master has been fashioned, and a model to a large scale of the house, the elevations of which were designed by Richardson, the architectural genius to whom America owes so large a debt. The exterior of the building is being carried out with that regard for texture which Richardson so firmly advocated and practised. Granite is used for the plinth, with sawn *tuff-stein* from the neighbourhood of Landsberg, near Munich, for the main walling, relieved by bands of roughly hammer-dressed red sandstone. A characteristic of all great artists was brought out by an inquiry as to the cost of bringing the *tuff-stein* from so great a distance, which elicited from Mr. Herkomer the answer, "I want the effect of this stone, and I must have it, no matter what it costs." To obtain the highest perfection of art, the cost, whether of thought or of labour, must be a matter of the least consideration, for if genius be not, as is sometimes said, an infinite capacity for taking pains, it is at least closely allied thereto.

Much of the internal woodwork of the house is completed, and here again the value of texture is fully illustrated by contrast of finish, of material, of tone, of method. The workshops in which the woodwork is executed are fitted with modern wood-working machinery, the motive-power being supplied by an Otto gas-engine, for Mr. Herkomer has an utter scorn for the idea that modern art-workmen should shorten their opportunity for artistic work by ignoring the advantages provided by modern engineering skill, for lessening the sheer labour of sawing, planing, and preparing work. Another side of the versatility of the artist was seen in a visit to the printing-room and etching-room, from which have proceeded the reproductive works which, being more accessible, spread over a larger area the enjoyment of an artist's skill that would otherwise be confined to the few who are wealthy, instead of the many, to whom art is a pleasure and a benefit as much as to the few. The method of mezzotint engraving was explained, as well as that of etching, and the operation of printing practically exemplified.

Having seen the various works in progress towards the erection of the house, and inspected the plans of the completed buildings, the visitors were next taken to the theatre, which has of late been so often described and spoken of, and here Mr. Herkomer showed them the first scene of his latest dramatic work, and allowed them to enjoy the reality and fidelity to nature of the scenic environment. The theatre, which, though small, is thoughtfully contrived, has its decoration simple in character, but displaying the same unity of thought and fertility of artistic invention which is seen in the house. The illusion of the scene having been duly appreciated, the members were invited on to the stage "to see how it's done," when the building up and lighting of the scenic accessories and the mechanical contrivances were inspected, and with that a most enjoyable and instructive visit brought to a close.

THE ARTISTS' BENEVOLENT FUND.

THE eightieth anniversary festival of this Fund was held on Wednesday evening, in the Freemasons' Hall, when the Bishop of Ripon presided over a company numbering 108 ladies and gentlemen.

The Right Rev. Chairman, in proposing the toast of the evening, "Prosperity to the Artists' Benevolent Fund," made a long and eloquent speech. He pointed out that, in the conduct of the Artists' Benevolent Fund, it was sought to encourage as much as possible the spirit of self-help; and such an organisation, the members of which subscribed year after year for the purchase of annuities, commended itself to the generosity of the public. He asked his hearers to remember the great obligations which the world owed to art. To those artists who lifted us out of ourselves, and tried to appeal to us from the standpoint of nobler things, was due a debt of gratitude surpassing that which was merely owing to the revelations of beauty. Art might well claim something at our hands for the benefits she was bestowing, the meaning, value, and comprehensive force of which could scarcely be understood. With the toast was coupled the name of Sir Henry Cartwright, a member of the Committee, who responded in the absence of the President of the Fund (the Earl of Derby).

The Archdeacon of London, in proposing "The Royal Academy" and kindred societies, referred to St. Paul's Cathedral as the burial-place of Sir Joshua Reynolds and other distinguished Academicians, and expressed regret that internally the walls of the Cathedral were still almost as bare as when Sir Christopher Wren left them to posterity to complete. He thought that if the artists of the country, as represented by the Royal Academy and the other artistic societies, would join together and co-operate in the work of decorating the interior of the Cathedral, the result would be very happy. It was matter for congratulation that we were now to have a National Portrait Gallery worthy of the nation, but what was much wanted also was a National Gallery of Sculpture, the absence of which from a great capital like London was, he thought, a great misfortune.

During the evening subscriptions and donations to the amount of 600*l.* were announced by the secretary, Mr. Lambton Young.

We may add that the Artists' Annuity Fund is raised and wholly supported by the contributions of its members for their own relief in sickness or old age; it neither asks for nor receives any support from the public. All artists in painting, sculpture, architecture, and engraving are eligible to become members. The Artists' Benevolent Fund, which is a purely charitable society, has for its object exclusively the relief of the widows and orphans of members of the Annuity Fund left in need; it is supported by the donations and subscriptions of the patrons of the fine arts and artists, and annual contributions of the members of the Annuity Fund. These annual sums, payable to the most needy of the widows, and to the orphans, are respectively supplemented by donations and from the interest on benefactions of Miss E. L. Pye and the late Mr. Edward Absolom. The claims of all widows and orphans who become entitled to its benefits are admitted at once, and without limit to their number. During the past year forty-eight widows and seventeen orphans received annuities, amounting in the whole to 1,018*l.* The annual sum of 20*l.* is paid to each widow, and the annual sum of 6*l.* to each orphan under the age of sixteen. The committee are anxious to increase these allowances as soon as the patrons of art will enable them to do so. Since the institution of the society the sum of 52,306*l.* has been distributed in relieving widows and orphans of artists whose circumstances render such assistance necessary.

ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The forty-sixth annual congress of this Association will be held this year at Lincoln, from Monday, July 29, to Saturday, Aug. 3, with three extra days to Wednesday, Aug. 7. The Earl of Winchilsea and Nottingham is the President of the meeting. The opening meeting of the Congress will be held in the County Assembly Rooms, on Monday, July 29, at 2 p.m., when the President and Members of the Association will be received by the Mayor and the Corporation. The Mayor and Mayoress will entertain the company at luncheon at 2 o'clock. The delivery of the address by the President will probably take place after the luncheon, at the close of which a visit will be paid to the following places, viz., Church of St. Peter at Gowts; Hall of St. Mary's Guild; Church of St. Mary le Wigford, and the old High Bridge. Opening dinner at the "Great Northern Hotel," at 7.30 p.m., the President in the chair.—At 9.30 a.m., on Tuesday, July 30, the Stonebow and Guildhall will be visited, and the seals, documents and insignia of the Corporation will be inspected. The old Grammar School (Grey Friars) will next be visited, also the two Norman houses on the Steep-hill, *en route* for the Cathedral, where at 11 a.m. the party will be met by the Rev. Precentor Venables, who will give a detailed description of the Cathedral. At 1.30 p.m. luncheon will be prepared at the "White Hart Hotel." At 3 p.m. the party will assemble at the Castle and inspect it; after which it will visit the following places, viz.: Roman remains in Bailgate and in the playground of North District National School; Roman Gateway (Newport) and Lines and Remains of Roman City Walls; Remains of Wall of Cathedral Close; Minster Green, Chancery and Pottergate Arch; Vicars' Court and Stables, and the Bishop's Palace. In the evening there will be a meeting at the School of Art at 8.30 p.m.—On Wednesday, July 31, the party will leave the Great Northern Station at 9.35 a.m. for Boston, and arrive there at 10.46 a.m., where the following places will be visited, viz.: the parish church, St. Botolph; the Town Hall and old warehouse in Spain-lane; the Grammar School, and Hussey Tower. Luncheon at the Shod Friars Hall, at 1 p.m. Leave Boston Station at 3.35 p.m. for Tattershall, and inspect the Castle and the (Holy Trinity) Church. If satisfactory arrangements can be made the party will also visit the ruins of Kirkstead Abbey, and what is described in the programme as "the fast-perishing little gem of architecture, the Parish Church of St. Leonard." The party will arrive at Lincoln, on return, about 7.16 p.m. —On Thursday, August 1, the party will leave the Great Northern Station at 9.2 a.m., for Sleaford, and inspect the Church and the ruins of the Castle. It will also drive to visit the Churches of the following villages—Kirkby Laythorpe, Asgarby, Heckington, Howell, and Ewerby. The Bishop of Nottingham has kindly offered to be the guide this day and on Friday. On Friday, August 2, the party will leave the Midland Station at 9.45 a.m., for Newark, and arrive at 10.16 a.m., visit the Castle, Church, and old House in Market-place. A drive may also be made to Hawton Church (Easter Sepulchre), about two miles away. Lunch at Newark, and proceed at 1.59 p.m. to Southwell, inspect the Minster and the Old Palace, leave Southwell at 6.45 p.m., and reach Lincoln at 7.40 p.m. On Saturday, August 3, the party will leave the Great Northern Station, South Platform, at 9.42 a.m., for Gainsboro', and visit the Old Hall and Parish Church. Drive from Gainsboro' to the villages of Stow and Coates, and inspect the old Churches. Back at Lincoln about 3.30 p.m. Closing meeting to be held at School of Art at 4 p.m. The programme for the three "extra days" is as follows, —Monday, August 5: Leave Midland Station at 10 a.m. for Thornton, and inspect the Abbey; thence proceed to Barton-upon-Humber, and inspect the two Churches there. Back in Lincoln about 7.30 p.m. Tuesday, August 6: Drive to Navenby, Wellingore, Welbourn, Leadenham, and Brant Broughton, to see the Churches at these villages, and return to Lincoln *viâ* Somerton Castle. Wednesday, August 7: Leave Great Northern Station at 10 a.m. for Grantham, and visit the Church and the Angel Hotel (ancient), and the Grammar School; thence proceed by train to Belvoir Castle (Redmile Station), and return *viâ* Bottesford, and inspect Church, monuments, brasses, &c. The papers already promised for the Lincoln Congress include the following:—"Excavations on the site of the Roman Station, Vinovium, near Bishop Auckland," by the Rev. Dr. Hooppell; "Seals and Charters relating to Lincoln," by Mr. W. de Gray Birch, F.S.A.; "The Churches of Boston, Grantham, and Lincoln," by Mr. E. P. Loftus Brock, F.S.A.; "Notes on Certain Early Churches in Algeria, excavated by the French," by Mr. E. P. Loftus Brock, F.S.A.; "The Churches of Lincolnshire," by Mr. E. P. Loftus Brock, F.S.A.; "Pre-Norman Sculptured Stones in the County of Lincoln," by Mr.

J. Romilly Allen, F.S.A.Scot.; "The Castle of Lincoln," by Mr. George Patrick; "The Roman Walls of Lincoln," by Mr. C. Roach Smith, F.S.A.; "On a Roman Lanx found at Lackenham Fens, Suffolk," by Mr. Henry Prigg; "The Rose of Provence and the Lilies of France," by Mr. Thomas Morgan, F.S.A., V.P., Hon. Treasurer. Papers are also promised by the Rev. A. R. Maddison, Succentor and Priest-Vicar of Lincoln Cathedral; Mr. H. Ingram, Mr. George R. Wright, F.S.A., the Lord Bishop of Nottingham, and others, on various subjects.

Royal Archæological Institute of Great Britain and Ireland.—This year's annual meeting is to be held at Norwich, from Tuesday, August 6, to Wednesday, August 14. The President of the meeting is the Duke of Norfolk, K.G., E.M., and the Presidents of Sections are as follow:—Antiquarian Section: the Rev. C. R. Manning, F.S.A. Historical Section: the Rev. A. Jessopp, D.D. Architectural Section: Mr. J. Willis Clark. The secretaries of this last-named Section are Mr. Edward Boardman, jun., and Mr. T. S. Gleadowe. The following is an outline programme of the proceedings of the meetings:—On Tuesday, August 6, at noon, the Mayor and Corporation and the members of the Norfolk and Norwich Archæological Society will receive the Institute at the inaugural meeting in St. Andrew's Hall, when the President's address will be delivered. After luncheon there will be an inspection of the Cathedral. The Rev. C. R. Manning will open the Antiquarian Section in the evening. On Wednesday, August 7, the members will go by rail to Swaffham, thence by road to Castle Acre to view the Roman earthworks and Castle. Luncheon. Church and Priory. By road to Dunham Church, to Fransham Station. By rail to Norwich. Mr. J. Willis Clark will open the Architectural Section in the evening. On Thursday, August 8, the annual meeting of the Members of the Institute will be held at 10 a.m. Immediately afterwards, the Rev. A. Jessopp, D.D., will open the Historical Section. Afterwards the Castle will be visited. Luncheon. Inspection of City. Carrow Priory. Conversazione by the Mayor in St. Andrew's Hall in the evening. On Friday, August 9, the party will proceed by rail to Cantley. By steamboat to Burgh Castle (Gariononum). By steamboat to Great Yarmouth. Inspection of Church and Town. Dinner. Sections. By rail to Norwich. On Saturday, Aug. 10, there will be an excursion by rail to Holt; thence by road, *viâ* Letheringsett, to Cley Church, to Blakeney Church. Luncheon. By road to Binham Priory, to Melton Constable Station. By rail to Norwich. Sections. On Sunday, Aug. 11, there will be special services in the Cathedral. On Monday, Aug. 12, there will be an excursion by rail to Cawston. On foot to the Church. By road to Sall Church, to Heydon. Luncheon. By road to Blickling Hall, to Aylsham. By rail to Norwich. The concluding meeting will be held in the evening, but there will be two extra days. On Tuesday, Aug. 13, there will be an excursion by rail to Wroxham; thence by road to Barton Turf Church, to Tunstead Church, to North Walsham. Luncheon. By road to Bromholm Priory, to Knapton Church, to Trunch Church, to North Walsham. By rail to Norwich. On Wednesday, Aug. 14, the party will proceed by rail to Wroxham; thence by steamboat to Ranworth. On foot to Church. By steamboat past the ruins of St. Benet's Abbey to Acle. By rail to Norwich.

Cambrian Archæological Association.—The forty-fourth annual meeting of this Association will be held this year in Brittany during the fortnight commencing August 12, 1889, when excursions will be made from Auray and Morlaix. The following is the programme (subject to revision): Monday, August 12, members will leave Southampton in the evening by the London and South-Western Railway Co.'s steamer direct for St. Malo. On arrival at St. Malo in the morning of the 13th, members will take the train for Redon (*viâ* Dol and Rennes) and sleep there the night. On Wednesday, the 14th, members will proceed by train in the morning to Vannes, stopping there to inspect the Museum and Cathedral, and then going on to Auray in the evening, where the party will remain for the next five nights. On Thursday, August 15, Excursion No. 1 will be made by carriage to Lomarec, stopping to see inscribed Sarcophagus, and then through Crach to Locmariaker, to inspect Megalithic remains, including the Sculptured Dolmen of Dol ar Marchand, the great fallen Menhir, the Chambered Cairns of Manć-Lud and Manć-er-H'roëk, &c. Afterwards, the party will be taken by boat to visit the celebrated Sculptured Gallery and Chamber in the Tumulus on Gavr Inis.—On Friday, the 16th, Excursion No. 2 will be made, by carriage, through Plouharnel, to Camac, to see the alignments of standing stones, Mr. Miln's Museum, the Roman Villa at Boconno, the chambered Tumulus of Mont St. Michel, with its Chapel and Cross, and several sculptured and cup-marked Dolmens.—On Saturday, the 17th, the third excursion will be made, by carriage through Bels, to see the Church of St. Cado, containing paintings illustrating the life of the patron saint, and situated on an island connected with the mainland by a Roman causeway 300 ft. long. Thence to the inscribed pillar-stones at Locoal-Mendon and Caer Bili, near Landivant, and the early crossed stone at the Chapelle de Legeven in the same neighbourhood. On Monday, the 19th, there will be a railway journey, *viâ* Quimper and Landerneau, to Morlaix, where the party remain for the rest of the time. On Tuesday, the 20th, excursion No. 4 will be made by rail to St. Pol de Leon, to see the Cathedral, founded by St. Paul Leonensis, and containing a quadrangular Celtic ecclesiastical bell, and the reputed tomb of Conan Mériadec; the Kreisker Church, with its open spire 270 ft. high. If time allows, the excursion will be continued to Roscoff, where there is a chapel dedicated to St. Ninian, built by Mary Queen of Scots to commemorate her landing here in 1588; and also a fine Allée Couverte. On Wednesday, Aug. 21, the fifth excursion will be made, by carriage, to see the Calvaries and Churches at St. Thegonnec and Guimilian, and the churches of Lampaul and Landivisiau. On Thursday, August 22, the sixth excursion will take place, by train to Lannion, *viâ* Plouaret, and then by carriage through Perros Guirec to Ploumanach, to see the Shrine of St. Guirec, the fine sea-coast of the district associated with the legends of King Arthur, the Rocking-stone at Cos Castel, and the Pagan Menhir with late Christian sculptures near Ploemeur. On Friday, the 23rd, the party will leave Morlaix in the morning for St. Malo, and return to Southampton by the night boat.

Surrey Archæological Society.—The annual excursion of this society is announced to take place on Thursday next, July 25, and will be to Limpsfield and Titsey. The rendezvous is to be at the railway-station, Oxted, at 11.30 a.m. After visiting Detillen's house, the members will proceed to Limpsfield Church, which is to be described by Mr. John Oldrid Scott, F.S.A. The Manor House will also be visited, and thence the company will drive to Titsey to inspect the Roman Villa in the park. This will be described by Mr. Granville Leveson-Gower, who will also act as the president for the day. The Pilgrim's Way will be described by Mr. George Payne, F.S.A. Mr. Ralph Nevill, F.S.A., will also make some remarks on the march of Plautius and Vespasian in A.D. 43. At Titsey Place Mr. Leveson-Gower will show and describe the house, and the many objects of interest contained therein, which include the Museum, with relics from the site of the Roman Villa, and other Roman and Mediæval antiquities found in the neighbourhood, portraits and mementoes of the Gresham family, the wedding-ring of Sir Thomas Gresham, and the portrait by Sir Antonio Moore, &c. Titsey Church will also be inspected. Such is the programme to this interesting district, which has not been visited by this Society since August 9, 1865, on which occasion Mr. G. Leveson-Gower read papers on Titsey and the Roman Villa, which are published (with illustrations) in the fourth volume of the Society's Transactions. The church was then recently erected from the designs of Mr. J. L. Pearson, R.A., architect. Limpsfield Church was described in 1865 by Major Alfred Heales, F.S.A., whose paper thereon (with illustrations) will also be found in the aforesaid volume of the "Transactions." In 1871 this church underwent considerable repair and renovation under Mr. J. L. Pearson, R.A., and these proceedings led to the subject of a second paper (which will be found published in the sixth volume of the Society's "Transactions" by Major Heales, who concludes with these remarks:—"The timber roofs have all been brought to light during the restoration. The nave roof is a fine example of the cradle form. The triplet in the chantry is filled with glass by Clayton & Bell. Open seats of oak have been substituted for the former high pews, and the floor has been laid with ornamental tiles. The works had been carried out with much care, under the direction of Mr. J. L. Pearson, the architect. The upper windows in the tower have been restored with stone, and lengthened to their original proportions, which had brick jambs."

Congress of Archæological Societies.—On Wednesday afternoon an important conference of the delegates of some of the leading county archæological societies was held at the rooms of the Society of Antiquaries at Burlington House. Mr. John Evans, D.C.L., President of the Society of Antiquaries, was in the chair, and (according to the report in the *Times*, upon which we are dependent for information, as we received no invitation to send a reporter to the meeting) announced that only a single society of the large number that had been invited to join the union had declined their invitation, which was in itself a proof of the utility of the work in which they were engaged. The first subject for discussion was the formation of county archæological maps on the plan already accomplished by Mr. Payne for Kent, and the following resolution, proposed by the Rev. Dr. Cox, and seconded by Mr. Ralph Nevill, was unanimously carried:—"That each local society be requested to take into consideration the desirability of placing on record on the large Ordnance maps of the county with which they are concerned all the local names of fields and all relics of antiquity for which a locality can be fixed; and that such maps should be kept in duplicate, so that eventually a copy may be deposited with the Society of Antiquaries." The question of the preservation of ancient monuments and buildings was next discussed. General Pitt-Rivers, Inspector of Ancient Monuments, gave an interesting account of the working of the Act under which he was appointed. Eventually Mr. J. T. Micklethwaite proposed, and Mr. Leveson-Gower seconded, the following resolution:—"That all local societies be requested to be on the watch against any wilful or injudicious destruction of ancient monuments or buildings, so as at once to bring local opinion to bear against the destroyers; and that in case of what appears to be national importance the aid of the Society of Antiquaries or of the Inspector of Ancient Monuments be invoked." A third subject brought before the Conference was the publication of parish registers, introduced by Mr. Ralph Nevill, about which there was much talk and some little difference of opinion. The result was the nomination of a small committee to deal with the subject, and to report to the different societies in union. The Rev. Dr. Cox brought forward the subject of provincial records, and spoke in favour of the proposal to make County Councils responsible for their due preservation. After much discussion the general opinion seemed to be that the delegates could not pledge themselves to the support of any definite scheme or Bill at the present conference; but it was moved by Dr. Cox, and seconded by Mr. W. G. Hardy, and unanimously carried:—"That the attention of the local societies in union be called to the proposed Bill, entitled An Act for the Preservation of Public and Private Records, which, it appears, may provide for a long-recognised want." The next conference was fixed for July, 1890.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday afternoon last in the Council Chamber, Guildhall, Lord Rosebery in the chair.

Appointment of a Mechanical Engineer.—The Standing Committee presented the following report:—"In continuation of the report made by your Committee at the last meeting, they have now to state that, having had communicated to them, by the joint-committee formed by sub-committees of the Main Drainage and Bridges Committees, the names of three applicants for the post of Mechanical Engineer whom the joint-committee considered the most suitable, they have, after seeing and examining the three candidates referred to, selected two for submission to the Council. The names of the two candidates are Mr. E. J. Atkinson and Mr. W. C. C. Smith. Your Committee recommend—

'That Mr. E. J. Atkinson be appointed to the office of Mechanical Engineer, at a salary of 500*l.* a year, upon the following conditions:—That he be directly responsible, under the Chief Engineer, for the whole of the machinery belonging to the Council, and for its economical working; that he do hold his office during the pleasure of the Council; that he be required to give his whole time to the duties of his office, and be not allowed to take any private practice; and that on retirement he shall not be entitled to any superannuation or pension.'"

On the names being put to the vote, the numbers were: Atkinson, 37; Smith, 18. Mr. Atkinson was then formally elected.

A Question as to Tenders.—The Asylums Committee presented a report, in which the following paragraph occurred:—"Your Committee have also had before them the question of inviting tenders for the erection of the additional buildings for the enlargement of Cane-hill Asylum, and they have been informed that it has become a general practice with works of this character to invite tenders from a selected list of builders, and not to invite tenders by public advertisement. After giving careful consideration to the subject, your Committee have passed the following resolution, which they now report for the information of the Council:—

'That tenders for the execution of the work of enlarging the Asylum be obtained from a list of builders to be selected by the Asylums Committee.'"

This recommendation gave rise to a long discussion. Councillor Strong, in the absence of the Chairman of the Asylums Committee (Councillor Martineau), explained that the majority of the Asylums Committee were in favour of the course recommended, being advised by their architect that only by the adoption of a system of selection would they get really good builders to tender. It was very important that for the proposed works, which would probably cost at least 100,000*l.*, an honest and capable builder should be obtained; the chances of doing that would be diminished by putting the work up to open tender. Councillor Thornton and others strongly opposed the course proposed by the Committee, contending that, all things considered, the system of open tendering was in every way the most satisfactory. It was suggested by some of the speakers on this side that the system of selection would lend itself to jobbery of the worst kind,—to the formation of a "ring" amongst the selected competitors, and so on. The speakers on this side argued that it was for the architect and the clerk of the works to see that the builder whose tender was accepted carried out the work according to the terms of the contract. An amendment to the effect that it be an instruction to the Asylums Committee to throw the work open to public tender was carried, on a division, by 45 to 39.

The Architect's Department.—The Improvements Committee's Report contained the following paragraph and recommendation:—"Your Committee have received from the Architect a report stating that the staff in the branch of his department which is engaged on the work connected with improvements is utterly insufficient to enable him to deal with the various subjects which have been referred to him. He also draws attention to the fact that the three officers (exclusive of the Valuer) whose services were dispensed with last year, and whose united salaries amounted to 937*l.* 10*s.*, have not been replaced, and that he has only been granted authority to temporarily engage a shorthand-writer at 2*l.* 2*s.* per week. He states that additional assistance is necessary to adequately keep up the current work, and he therefore recommends some moderate additions to his staff. Your Committee are of opinion that the Architect is really in need of additional assistance, and that it is not economical to be shorthanded in this department.* They accordingly recommend—

'That steps be taken by the Standing Committee for carrying the suggestions of the Architect into effect with the least possible delay.'"

Councillor Lloyd moved, as an *addendum* to the recommendation of the Committee, the following words: "And that it be an instruction to the Standing Committee to consider whether it is not desirable to appoint an Assistant Architect." This was lost by show of hands by a large majority, and without discussion.†

The Alleged Breach of Contract by the Contractor of the Sewage Outfall Works at Crossness.—Councillor Rhodes, the Chairman of the Main Drainage Committee, was again questioned as to when the report on this question, involving a heavy fine on the contractor, would be presented. He gave the stereotyped reply "that it was receiving anxious and earnest consideration," — whereat the Council laughed, remembering how many months the subject has been in process of incubation.

Clissold Park.—In the course of the sitting the Chairman, Lord Rosebery, announced that Clissold Park, Stoke Newington, would be opened on Wednesday next, July 24, at 4 p.m.

CASE UNDER THE METROPOLIS MANAGEMENT AND BUILDING ACT (AMENDMENT) ACT, 1882.

AT the Westminster Police-court, Messrs. Simmonds, Bros., of Newton-street, Holborn, builders, were summoned by the London County Council for unlawfully erecting or setting up a wooden structure or erection of a moveable or temporary character, at Halkin-street, St. George's, Hanover-square, without a licence in writing from the Council, contrary to section 13 of 45 Vict. c. 14. Mr. Thos. Burton, solicitor, appeared for the Council, and the defendants appeared in person. The District Surveyor, Mr. Large, upon being called, proved that on June 6, 1889, Sir Edmund Antrobus called his attention to the structure, which was erected upon vacant land next to St. John's Chapel, in Halkin-street. In company with him he surveyed it, and found that it was 100 ft. long by 30 ft. wide, and 9 ft. high, covered with canvas. It consisted of timber uprights, standing on inch boards laid upon the ground. The uprights were connected at the top by other timbers and a wood flooring, and joists placed thereon. The uprights were partially strutted by inch boards. The uprights and cross timbers were connected by pieces of inch-boards laid flat and nailed. He told the foreman the consent of the Council was necessary. The defendant called upon him the next morning and stated they had been put all over London without consent, and he did not think any consent necessary. Witness considered it dangerous if a large number of people assembled there. It was used for the Duke of Portland's wedding-breakfast. Mr. Simmonds said, in answer to the charge, that the structure was not a building. It had only been up forty-eight hours, and that it would require a long time to get the consent of the Council, and would practically stop their business. Mr. D'Eyncourt said he would deliver his judgment on July 17.—On the adjourned hearing, he said that it was not a building, but a structure, and not exempted by the Building Act, and he should therefore impose a fine of 20*s.* without costs.

Presentation to the Surveyor of Chelsea. The Council Chamber of the Chelsea Townhall was well filled on Tuesday afternoon on the occasion of a presentation by Earl Cadogan, on behalf of the members of the Chelsea Vestry, to Mr. G. R. Strachan, the retiring Surveyor, of an illuminated address, an oak writing-table, and a silver tea service, in recognition of his services to the Vestry and the parish.

* We should say not.—ED.

† We must say that we do not understand this part of the proceedings. The position in question is not vacant, nor likely to be, so far as we have heard. Did Mr. Lloyd mean a second "Assistant Architect"? If not, was Mr. Lloyd's amendment in order? We doubt it.—ED.

THE CARPENTERS' COMPANY'S EXAMINATIONS.

SIR,—In the last number of the *Builder* you were good enough to insert a notice of these examinations, and to give the names of the successful candidates in the one recently held.

I should be glad to be allowed through your columns to draw the attention of some of the men who desire to fit themselves for the position of builder's foreman or for that of clerk of works to these examinations as a means of obtaining a certificate of very great importance; and to suggest also to my brother architects, and to builders, that men applying for employment in either capacity who are able to present this certificate are in possession of a testimonial of no ordinary value.

The object of the examiners is not simply to ascertain that the candidate is a competent carpenter or joiner, but to see that he possesses that amount of practical ability and general knowledge of *both* trades, and of the materials used in them, which a good clerk of works ought to possess. With this object a considerable range of subjects has been embraced, and the tests are of as practical a character as possible. There are obvious reasons why a Carpenter's Company should not travel outside the range of works in wood, but within that limit the candidates have ample opportunity for showing that they are well-qualified men.

T. ROGER SMITH.

University College, London.

The Student's Column.

WATER-SUPPLY.—III.

RAINFALL.—(*Continued*).

WE will now go more into detail as to how the amount of rainfall is measured, for accuracy in this respect is rigidly essential in getting out an estimate of quantity available; and it is well to know as to how far we are enabled to depend on the results obtained.

It is accomplished by instruments called rain-gauges. The most elementary form is called "Howard's," which is simply a funnel to catch the rain, and a Winchester quart bottle to retain it. The water thus collected is measured in a graduated glass, and the result is given in

The "Snowdon" Rain-gauge.

inches. The form in the annexed figure is an improvement on this, as devised by the Meteorological Office, the chief difference consisting in enclosing the funnel and bottle in a vertical cylinder, the top of which rises above the funnel, to catch snow and prevent it being blown out of the gauge. The diameter of the cylinder is 8 in., but Mr. Symons and others recommend the use of 5-in. gauges.

There are other far more elaborate instruments in use, but the one figured above is the kind commonly employed.

The instruments are examined once a day, at a fixed hour, usually 9 a.m. The sectional area of the top of the funnel being exactly known, and, knowing the amount of rain which has fallen within it, it is not difficult to calculate the amount that has fallen within the surrounding district from the data thus obtained, where such gauges are not far apart. For example, 1 in. of rain gives 100 tons of water per acre, or 60,000 tons per square mile. If an area of 2 square feet be covered by water, of the uniform depth of 1 in., and subsequently poured into a receiver, it will be found that it measures one gallon.

One would imagine from the foregoing that it was about the simplest thing possible to estimate rainfall, but such is not the case, and we will now proceed to point out where the results obtained are liable to err. In the first place, we assume that the amount of rain falling over a more or less large area is proportionate to that caught in a comparatively small space,—the mouth of the rain-gauge. Of this there is no absolute proof, as the amount falling varies so considerably even in short distances. Then, again, it is a very difficult matter to be sure how much actually falls into the gauge, because of evaporation, &c. On a very hot day it is well-nigh impossible to accurately measure the amount that has fallen during a passing shower. This, certainly, is well understood, and special precautions have been taken to minimise its effects,—still the fact remains.

We have to be careful where we place the gauge. It should not be near any buildings or other objects rising at any height from the surface of the ground, as these latter produce little wind-eddies, that cause a very uneven distribution of rain in their immediate vicinity. It has long been recognised that more rain is recorded by the gauge at the surface of the ground than at some height above it, and Messrs. Symons and Dines have clearly shown* that this is due to the eddies produced by the building or support on which the gauge is placed. The gauge should not be placed more than about a foot above ground.

Mr. R. H. Scott, M.A., F.R.S., gives us† a striking proof of the influence exerted by a vertical wall on the indications of a gauge placed on the top of it. The late Rev. Dr. Robinson told him that "he had constructed a peculiar gauge consisting of a sphere erected over a funnel, which, therefore, exposed the same section to the rain at whatever angle it might be driving. Under ordinary circumstances, this gauge collected more than one of the ordinary pattern. It was, however, erected on the parapet of the flat roof of the Observatory. The distance from the dormer window, which gave access to the roof, to the gauge, was about 30 ft. During one heavy gale, Dr. Robinson went up on the roof to see how the gauge was acting. It was raining so heavily that he was wet through while walking over the slight distance of ten yards, and yet not a drop of water was in the gauge; all had been blown over it by the eddies."

Rain-gauges are placed on a perfectly open site, but we think that this is liable to give very inaccurate data under certain circumstances. For instance, trees "attract" a great quantity of rain to their immediate vicinity, much of which is available for water-supply purposes, and which would not be measured by gauges at any considerable distance from them, and so on.

Thus we see how difficult it is to arrive at the actual rainfall in a district. Even supposing gauges were placed every mile or two from each other, although it would unquestionably be useful, the results obtained would not form an accurate index; much less, then, can we rely on information collected when they are scattered throughout the country at much greater intervals, as they are at present. Perhaps it may be urged that in face of all the difficulties, we should be able to form quite as good a judgment of the rainfall without the assistance of gauges; but this is not so. The student who goes into the subject will see that, whatever imperfections the gangings may have, they are relative, so to speak. The inaccuracies are common to all, and the results obtained undoubtedly show, even if it only be approximately, the relative amount of fall in various districts, and, by allowing a good margin, these data can be, and are, relied upon by the engineer for water-supply purposes.

The measurement of snow is effected by collecting what may be found in the gauge and

* "British Rainfall," 1880, p. 13; 1881, p. 41; and "Rep. Brit. Assoc." 1881, p. 161.

† "Elementary Meteorology" (International Sci. Ser.), 1883, p. 134.

thawing it, or melting it by adding a known quantity of warm water,—which, of course, must be deducted from the result of the measurement. Roughly speaking, a foot of snow gives an inch of water.

EVAPORATION.

The measurement of evaporation is made by an instrument called an atmometer, of which there are various forms. It, however, is a very difficult and uncertain operation, and our knowledge concerning evaporation generally, excepting in regard to its cause and effect, is in an extremely elementary condition. This is the more to be regretted, as the practical applications of this portion of our subject are numerous and important. Apart from the calculation of deductions to be made in arriving at the amount of water available for supply in a drainage-area, drying up the moisture in the soil, &c., we have to contend, especially in tropical countries, with the gradual evaporation of water in storage reservoirs. Mr. A. R. Binnie calculated that in the dry season of 240 days at Nagpoor, in India, as much as 4 ft. of water, or one-fifth of an inch per day, were evaporated from the reservoir, and the entire loss due to this cause was 54 per cent., or more than half of the annual supply of the tank.

Dr. Haughton* gives the following data for the torrid zone and its vicinity:—

Locality.	Latitude.	Evaporation.
Madras	13° N.	91·25 in.
St. Helena	17° S.	83·78 „
Nagpoor	29° N.	73·15 „

Mr. C. E. Greaves, C.E., gives† the following differences between the average rainfall and evaporation at Lea Bridge, near London, extending over a period of fourteen years:—

Excess of rain over evaporation *from water*	25·721
	20·613
	5·108
Excess of evaporation from water over evaporation *from ground*	20·613
	18·138
	2·475

In only three years did evaporation exceed the rainfall.

It is tolerably certain that in nearly all parts of the globe, in situations not far from the sea-coast, the rainfall, and evaporation from a free water surface, are about equal.

Books.

The Elementary Principles of Electric Lighting. By ALAN A. CAMPBELL SWINTON. (London: Crosby Lockwood & Son. 1889.)

THE author commences his book by the question, "What is Electricity?" and then carefully explains that in assuming it to be a fluid, he does so simply for the purpose of explaining its fundamental principles by the aid of hydraulic analogies; if, therefore, any of his readers get wrong ideas by carrying the analogy too far, it will not be from want of timely warning that, closely as electricity resembles a fluid in its general behaviour, it possesses many properties peculiar to itself, and its real nature is not yet fully known.

The difficult task of explaining to unscientific readers what is meant by "an electric current," "electro-motive force," &c., &c., as well as the definitions of the commoner units used in making electrical measurements, has been performed in a particularly happy way; many persons who profess to be electricians would do well to study carefully this portion of the book. Owing to its extremely elementary character, this little book leaves much for the beginner to learn about many of the simplest points in electric lighting, but it possesses the greatest of all merits in a popular exposition of any technical subject, namely, that in pursuing his studies further the reader will not have to *unlearn* anything Mr. Swinton has taught him. Throughout, the author says just enough to express the idea he wishes to convey, and stops at the point where popular and untechnical language would fail. A few words about galvanic batteries and magnetism leads to the subject of magneto-electricity and dynamo-electric machines. The value of this book would have been much increased had the same care been bestowed upon the illustrations as upon the text. On page 21, fig. 7, is shown a portion of an alternating-current machine with the current flowing through the armature in the wrong direction; but the illustration of the continuous-current dynamo, page 25, fig. 10, betrays a far worse blunder, for if the current were made to flow round the field magnet cores as drawn, the machine would consist of a gramme ring revolving in a field produced by two north poles, an ingenious contrivance by which no current could possibly be generated.

As the direction of the current produced, when a conductor moves through a magnetic field is not explained, these errors will pass unnoticed by the general reader, but they should not be found in the second edition of a book of this character. The section devoted to electric lamps would be improved by a brief description of some typical regulating device for arc lamps, and some mention should be made of the cut-out used in conjunction with lamps run in series.

The section on electric accumulators follows that on electric lighting installations. This is an odd arrangement, as in consequence of it no accumulators are shown in the installation diagrams; this is, perhaps, the weakest part of the book. The author may, of course, have his own views as to the desirability of relying upon accumulators, but considering how extensively they *are* used, the way of connecting them with a circuit should be shown. A section on electric transformers brings the book to a close, and a useful little index has been added.

Although galvanometers, ammeters, voltmeters, and photometers are all referred to in turn no special mention is made of electricity meters. This omission should be remedied in a future edition, as it was long said by the enemies of the electric light that it could never come into universal use until supply by meter was possible. With the exception of the errors in the diagrams, which we have already pointed out, the information to be obtained from this valuable little book is remarkably reliable and well put. The matter the book does contain is so excellent that it seems a pity there is not more of it.

Electric Light for the Million: (A Handbook for the Uninitiated, of Concise, Practical Information on Electric Lighting and its Cost). By ARTHUR FREDERICK GUY. London: Simpkin, Marshall, & Co.; York: J. Sampson. 1889.

THE contents of this little book resemble strongly the introductory remarks that so frequently precede the price-lists of electric lighting firms; it will, however, doubtless fall into the hands of, and interest, many who would not be likely to study trade catalogues. After a few remarks and figures setting forth the "progress and advantages" of the electric light, the author discusses its "production" and the "systems of lighting." This part of the work is especially disappointing, as it merely describes the methods of lighting by arc or incandescent lamps worked by the continuous current, either direct from the dynamo-machine or from secondary batteries. Not one word is said about alternating-current machines, converters, or any of the apparatus or devices which have of recent years made town lighting a commercial possibility; it hardly seems probable, therefore, that this little work will "induce gas companies to consider the advisability of utilising their premises as Central Stations," according to the hopes of the author, expressed in his preface. The section relating to the "approximate cost of installations," should prove useful by showing the "uninitiated" millowner or householder, that the installation and maintenance of a small lighting plant is by no means the expensive luxury it was formerly supposed. Such figures can never be more than rough estimates, but when given by an author who abstains from advocating the plant of any particular manufacturer, they are far more likely to carry conviction with them than when read in an advertisement professedly setting forth the advantages claimed for any particular patents. Under the heading "Practical Hints and General Remarks," are given some very useful instructions for keeping in working order dynamo-machines and accumulators, and it is a great pity that this really valuable and reliable part of the book has been marred by an attempt on the part of the author to become scientific and define the meaning of terms commonly used by electricians. For example, we have always laboured under the impression that quantity of electricity was measured in coulombs, and current in ampères, and that the relationship between these two was the same as that between a distance of forty miles and a speed of forty miles per hour; but "the million" are taught that "Quantity is expressed in ampères, and is called current." Again, Mr. Guy tells us that "1 Board of Trade unit = 10,000 watts," while the Board of Trade defines its unit as "the energy contained in a current of one thousand ampères flowing under an electro-motive force of one volt during an hour,"—that is, the energy conveyed by a current delivering power at the rate of 1,000 watts for a period of one hour. We cannot ourselves reconcile these two definitions. The general arrangement of the book is good, and it is to be regretted that the author has not seen fit to modernise his descriptions of the methods of lighting, and to be accurate in his definitions of technical terms.

* "Six Lectures on Physical Geography," 1888, p. 165.
† "Min. Proc. Inst. Civil Engineers," vol. xlv. (1876), p. 30.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

9,803, Building Construction (Fire-escape). A. J. Hogan.

According to this invention, the walls of houses are so built as to provide a permanent means of escape in the event of fire. Steps and hand-irons are built in regular intervals, or are added to the walls after the building is put up.

10,298, Chimney-pots. J. Way.

This invention relates to an improved ventilator, or chimney-pot, intended to cure smoky chimneys and to prevent down-draught. Flanges, sloping upwards, are fixed on hinges inside the pot, and allow the smoke to ascend, but act as baffle-plates, and prevent down-draught.

11,610, Paving Bricks. H. Johnson.

On the upper or wearing surface of the paving brick which is the subject of this patent there is formed a series of projecting ribs running parallel, or nearly so, to the longer sides of the brick. These ribs are rounded at their top edges, and the troughs, or depressions, between them are rounded at the bottom. In some cases these ribs are made to run obliquely to the sides of the brick, but for ordinary purposes they are all of the same size, and arranged in rows end to end, with reference to the longer sides of the brick. The ribs, when the pavement is laid, cross at right angles to the walk, and afford a good foothold and safety. The pavement is also of uniform pattern, there being no observable difference at the junction of the bricks. A pavement made this way is readily cleaned by sweeping crosswise,—that is, toward the gutter at the edge of the pavement.

12,499, Windows, &c. R. Mason.

According to this invention, no pulleys, weights, or cords are used. The improved method simplifies and cheapens the construction of the frame, and allows of easy adjustment and fastenings, while, at the same time, the casements can be placed in such positions as to be particularly adapted for ventilation or cleaning. The frames are pivoted in the centre, and the special method of opening and fastening them is the important feature of the invention.

4,522, Glazing-bars. I. Page.

The glazing-bars which are the subject of this patent are constructed in such a shape that the lead does not need additional fastening to the wood: it keys itself on leaving a sufficient flange of lead on both sides of the bars to turn up and lap over the edge of the glass.

6,653, Wood-carving Machine. E. Köster.

This invention relates to a machine for carving duplicate patterns by means of a kind of mechanical pantagraph, and is especially applicable for producing carved ornamental mouldings such as are used for making picture-frames, decorating furniture-panels, &c.

8,060, Metallic Lathing. J. Maw.

According to this invention, the laths are made corrugated and with slits or slots, in order that plaster or mortar applied to their surfaces may bind better. The form adopted also reduces to a minimum the unsightly cracking of the plaster common in ceilings. Mortar in itself forms a preventive of rust, and tends to preserve the lathing. In some cases the metallic laths are coated with asphaltum or composition to prevent rust.

NEW APPLICATIONS FOR PATENTS.

July 1.—10,610, C. Showell, Sash, Door, and other Handles.—10,616, J. Wilson, Fire-resisting Flooring, &c.—10,618, H. Atkin, Securing Closed Doors.—10,632, G. Hay, Firegrates or Stoves.

July 2.—10,646, E. Calone and F. Chapman, Stoves and Ranges.—10,655, E. Adams, Window-fastener.—10,663, C. Winton, Sewer-gas Trap.—10,677, J. Marston, Opening and Closing Fan-lights, Skylights, or Casements.—10,694, A. Curtis and A. Yeates, Ventilator.

July 3.—10,722, M. Robinson, Hinges for Water-closet Seats.—10,754, J. Dean, Flushing Closets with the Waste Water from Sinks.—10,759, E.

Massey, Fireplaces.—10,770, E. Edwards, Movable Centrerings for Masonry or other Arches Built between Iron Girders.

July 4.—10,824, J. Brunton and L. Griffiths, Artificial Stone, Concrete, &c.

July 5.—10,839, T. Switzer, Mitreing Mouldings. —10,858, E. Baldwin, Paint.—10,902, J. Tonge, Preventing Down-draughts and Quickening Up-draughts in Chimneys, &c.

July 6.—10,914, H. De Lespare and W. Shafto, Concrete.

PROVISIONAL SPECIFICATIONS ACCEPTED.

3,513, W. and H. Hoskin, Lock Furniture.—7,988, M. Farrell, Fastenings for Windows.—8,114, T. Bate, Water-closets.—8,272, H. Brookfield, Flushing Water-closets, Drains, &c.—8,546, T. Horner, Hinges, &c.—8,914, A. Tonks and F. Baker, Flush-bolts for Doors, &c.—8,961, E. Hauff, Window-fastenings.—9,045, G. Belling, Window-sash Fastener.—9,119, E. Fiford, Electric Bells.—9,533, A. Johnston and C. Hayward, Ventilation.—9,543, J. Roberts, Door Frames and Sashes.—9,644, W. Byers, Preventing the Shaking or Rattling of Window-sashes.—9,742, I. Smith, Ventilating Flues for the prevention of Down-draught.—9,760, A. Katz, Ceilings.—10,257, C. Harding and A. Hunt, Bakers' Ovens.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

9,648, J. Phillips, Sanitary Trap Gully.—9,751, F. Smith, Caps or Heads for Ventilating and Flue Shafts.—9,761, J. Palmer, Plastic Wall Decoration Composition.—12,708, E. Nunan, Metal Laths for Building Purposes.—8,435, W. Thompson, Fastenings for Windows, Doors, &c.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JULY 4.—By DRIVER & Co. (at Guildford).

Surrey—"Bramley Manor Farm" and 69a. 1r. 34p., f.	£3,500
Bramley Toll-gate and 0a. 2r. 38p., f.	460
"Bramley Manor House" and 2a. 0r. 22p., f.	800
Thanes Croft and 4a. 3r. 28p. f.	1,700
"Yieldhurst Farm" and 20a. 2r. 35p., f.	950
"Derry's Farm" and 178a., f.	3,000
"Northbrook Hill Farm" and 32a. 3r. 16p., f.	3,000
"Derry's Hill House" and 20a. 1r. 7p., f.	855
Enclosures of f. land, 33a. 0r. 4p.	1,410
The Stroud Brick and Tile Yd., 18a., f.	440
Several cottages and 11a. 2r. 38p.	1,025
Numerous enclosures of land, 46a. 0r. 6p.	3,130

By G. E. SWORDER & SONS (at Bishops Stortford).

Herts, Forscaux Pelham—Four enclosures of land, 12a. 2r. 12p., f.	170
Albury—F. cottage and garden land	102
"Langley Hall Farm," and 220a. 3r. 1p.	1,900
"The New Farm," and 67a. 3r. 18p.	630
"The Manor of Langley," with its rights, &c.	150
Enclosures of land, 41a. 2r. 32p.	490

JULY 5.—By FAREBROTHER, ELLIS, & Co. (at Wakefield).

Wakefield, near—Five enclosures of f. meadow land, 21a. 1r. 26p.	1,050

By HUMBERT, SON, & FLINT (at Rickmansworth).

Rickmansworth—Twelve plots of f. land	1,251

JULY 6.—By Messrs. COBB (at Canterbury).

Faversham, near—Three cottages and 14a. 1r. 15p.	1,900
F. marsh land, 36a. 0r. 30p.	1,100
F. hop, arable, and woodland, 50a. 0r. 25p.	5,415
Sixteen f. cottages with gardens	2,355
Two cottages and coast-house, f.	900

JULY 8.—By W. W. JENKINSON.

Tulse Hill—The f. house, "Silwood," and 4¼ acres.	6,000

By R. J. COLLIER.

Peckham—1 and 2, Ann's Cottages, f.	295

By BENINGFIELD & TIDY.

Hampstead—"The Hare and Hounds" public-house, f., r. £60 p.a.	1,560
F.g.r. of £50, with reversion in 77 yrs., to e.r. £800 p.a.	1,350
Ealing—Six villa residences, u.t. 79 and 87 yrs., g.r. £90, r. £198 p.a.	900
1 to 4, Western-rd., u.t. 73 yrs., g.r. £9, r. £98 p.a.	735
21 to 24, Western-rd., u.t. 73 yrs., g.r. £9, r. £98 p.a.	640
25, 26, 30, 31 and 32, Western-rd., u.t. 73 yrs., g.r. £6. 12s., r. £109. 8s. p.a.	750
33 to 38, Western-rd., u.t. 73 yrs., g.r. £7. 4s., r. £134 p.a.	1,010
Herts, Perry-green—"Bucklar's Farm" and 137a. 3r. 27p., f.r. £191. 6s. p.a.	1,800
"Warren Farm" and 86a. 2r. 0p., f.	900
Enclosures of f. land, 6a. 2r. 13p.	100
Hadham—"Hogland's Farm" and 55a. 0r. 28p., f., r. £73 p.a.	600
Two f. cottages and 0a. 1r. 31p., r. £15 p.a.	200
Forest-hill—6, The Pavement, u.t. 84 yrs., g.r. £10, r. £70 p.a.	795

By DEBENHAM, TEWSON, & Co. (at Bournemouth).

Bournemouth—Ten f. building sites	4,147

By Messrs. COBB (at Folkestone).

504 Shares of £10 each, paid up, in the Folkestone Water Works Company	11,064

JULY 9.—By FAREBROTHER, ELLIS, & Co. (at Ipswich).

Felixstowe—A plot of f. land, 6a. 2r. 30p.	3,020
Four plots of land, f., 13a. 3r. 28p.	5,830
East Bergholt—Two cottages and stabling, f., r. £27 p.a.	310

By MONTAGU & ROBINSON.

Woolwich—35 to 39, Coleman-st., f., r. £90 p.a.	1,165
11 and 13, Unity-pl., f., e.r. £66 p.a.	580

By FULLER, HORSEY, SONS, & CASSELL.

Cubitt Town—The London Rice Mills and Wharf, u.t. 53 yrs., area 59,000 ft., ex machinery	5,000

By PHILLIPS, LEA, & DAVIES.

Finsbury—99, Paul-st., u.t. 22 yrs., g.r. £7. 4s., r. £42 p.a.	£335

By H. C. NEWSON.

New Bond-st.—No. 151, Corporation lease, r. £359 p.a.	10,300
No. 39, Conduit-st., Corporation lease, r. £525 p.a.	11,900

By HAMPTON & SONS.

Chobham, Surrey—"The Warren" and 13a., f.	6,000

By A. RICHARDS.

Hammersmith—1a, Mansion House-st., u.t. 75 yrs., g.r. £4, r. £26 p.a.	335
Poplar—18, North-st., c., r. £26 p.a.	200
28, North-st., and a plot of land, c., e.r. £54 p.a.	455
45, Pennyfields, c., r. £23. 8s p.a.	150

By DEBENHAM, TEWSON, & Co.

Hoxton—18, Branch-pl., f., r. £21 p.a.	240

By DRIVERS & Co.

Bowers Gifford, Essex—"Jotman's Hall Farm," 234a. 1r. 12p., f.	2,280
Camberwell-rd., No. 294—F.g.r. £43, with reversion in 71 yrs.	1,120
Nos. 302 and 304, Camberwell-rd., f., r. £155 p.a.	3,100
Denmark Hill—No. 1, f., r. £52 p.a.	1,150
Bromley—F. plot of land	380

JULY 10.—By D. SMITH, SON, & OAKLEY.

Twenty £100 shares, £3. 10s. paid up, in the Law Fire Insurance Company	340
City, St. Swithin's-lane—The letting of 3,160 ft. of land, on lease for 80 yrs. Realised £1,400 p.a.	

By EGERTON & BERACH.

Richmond—21 and 22, Dunstable-villas, u.t. 73 yrs., g.r. £7. 10s., r. £39 p.a.	410

By H. GOODWIN.

Peckham—31, Waghorn-st., u.t. 84 yrs., g.r. £5, r. £26 p.a.	145

By PROTHEROE & MORRIS.

Leyton, High-st.—f. house, with possession	250

By CHINNOCK, GALSWORTHY, & Co.

Wandsworth Common—6 and 7, St. Ann's-hill, u.t. 32 yrs., g.r. £12. 12s., r. £140 p.a.	1,000

By J. A. SMITH.

Hammersmith—44, Glentherne-rd., f., e.r. £60 p.a.	610

By FAREBROTHER, ELLIS, & Co.

Fulham—"Colehill House" and 7a. 1r. 22p., f.	10,700
Walbrook—No. 26, f., r. £350, advancing in 6 yrs. to £400 p.a.	6,000

JULY 11.—By COOK & SMITH.

Upminster, Essex—The residence called "West Lodge," f., r. £75 p.a.	1,400

By T. B. WESTACOTT.

Shepherd's Bush—82, Coningham-rd., u.t. 78 yrs., g.r. £6, 10s., e.r. £35 p.a.	170

By Mr. MORGAN.

Croydon—41 to 44, West-st., f.	530

By G. A. BICKERTON.

Lewisham—51, Loampit-vale, f., r. £50 p.a.	630
Peckham—"East Gate Lodge," u.t. 21 yrs., g.r. £15. 12s., r. £65 p.a.	200

By REYNOLDS & EASON.

Stoke Newington—75, Spencer-rd., u.t. 52 yrs., g.r. £5. 5s.	330
South Hackney—78, King Edward-rd., u.t. 49 yrs., g.r. £10, e.r. £8	750
Kilburn Rise—The residence called "Lion Lodge," u.t. 84 yrs., g.r. £2	1,850

By DOWSETT & Co.

Pimlico—23 and 25, Sutherland-st., u.t. 44 yrs., g.r. £16, r. £130 p.a.	1,150
Barnsbury—30, Richmond-rd., u.t. 53 yrs., g.r. £5, r. £50 p.a.	465
Clacton, Essex—"Clacton Cottage," and 21a. 3r. 2p., f.	800

By PHILLIPS, SON, & NEALE.

Paddington—9, Chepstow-villas, f., r. £80 p.a.	1,030
19 and 20, Pickering-pl., u.t. 16 yrs., g.r. £10. 10s., r. £91 p.a.	480
15, Ledbury-rd., u.t. 54 yrs., g.r. £5. 5s., r. £57. 10s. p.a.	540
24 and 26, Pembridge-villas, u.t. 54 yrs., g.r. £30, r. £300 p.a.	1,050
Campden Hill—21, 35, and 41, Bedford-gardens, u.t. 34 yrs., g.r. £36. 16s., r. £170 p.a.	1,625

By NEWSON & HARDING.

Green Lanes—4, King's-rd., u.t. 70 yrs., g.r. £8, e.r. £48 p.a.	310
1 to 9, Albert-tce., u.t. 90 yrs., g.r. £56, r. £253 p.a.	1,400
Wimbledon—F.g.r. of £68. 5s. with reversion in 90 yrs.	1,470
F.g.r. of £10 with reversion in 94 yrs.	485
F.g.r. of £15 with reversion in 89 yrs.	350
Bromley-by-Bow—F.g.r. of £20 with reversion in 78 yrs.	415
F.g.r. of £15 with reversion in 78 yrs.	300
F.g.r. of £6 with reversion in 79 yrs.	120
Walthamstow—F.g.r. of £27 with reversion in 90 yrs.	648
F.g.r. of £27 with reversion in 91 yrs.	648
Stoke Newington—56, 58 and 60, Bouverie-rd., u.t. 82 yrs., g.r. £16. 10s., r. £76 p.a.	600

By J. G. & A. PREVOST.

Victoria Park—59, Gore-rd., u.t. 65 yrs., g.r. £8, e.r. £42	410
St. George's-in-the-East—21, 22, and 23, Station-pl. and 33, Dean-st., u.t. 18 yrs., g.r. £46. 10s., r. £96. 10s. p.a.	100
Poplar—17, 19, and 21, Ricardo-st., u.t. 39 yrs., g.r. £5, r. £40. 8s. p.a.	175

By E. STIMSON.

Brixton—118, Sussex-rd., u.t. 34 yrs., g.r. £5, r. £32 p.a.	240
Lambeth—90 and 92, Hartington-rd., u.t. 18 yrs., g.r. £6. 6s., r. £50 p.a.	205
Old Kent-rd.—Nos. 740 to 746 (even), and a g.r. of £30, u.t. 21 yrs., g.r. £43. 9s., r. £142 p.a.	630
Battersea—14 and 16, Penrith-st., u.t. 75 yrs., g.r. £8, r. £50 p.a.	415
Newington-butts—3, Albert-st., u.t. 54 yrs., g.r. £8, r. £42 p.a.	£335
Brixton—131, Loughborough-park, u.t. 36 yrs., g.r. £9, e.r. £80 p.a.	600
Peckham—66, Donnetta-rd., f., e.r. £30 p.a.	240
Forest-hill—34 and 36, Dalmain-rd., f., r. £46. 10s. p.a.	350
Thornton-heath—9 and 10, Burton-rd., u.t. 75 yrs., g.r. £11. 10s., r. £46 p.a.	215
Surbiton-hill—"Sunderland House," f., e.r. £45 p.a.	300
Hackney—75, Eleanor-rd., u.t. 60 yrs., g.r. £5, e.r. £28 p.a.	330

By C. C. & T. MOORE.

Leyton—3, 5, and 6, Garfield-ter., f., r. £34 p.a.	925
Hackney—374 and 376, Mare-st., f., r. £160 p.a.	2,225
Mile-end—23 to 26, King-st., f., r. £104 p.a.	945
Bow—216, Bow Common-lane, u.t. 73 yrs., g.r. £6, r. £30	310

By WORSFOLD & HAYWARD (at Dover).

Dover—32, Trevanion-st., f.	510
11, Townwall-st., f.	310
4, Blucher-row, f.	110
54, Maison Dieu-rd., f., r. £14 p.a.	315
22, Tower-st., f.	135
Charlton—3, Alexandra-cottages, f.	151
Buckland—39 and 40, George-st., f.	185
Sythorne—A plot of land and five cottages, f.	260

July 12.—By HUMBERT, SON, & FLINT.

Euston-rd.—No. 164, u.t. 10 yrs., g.r. £28. 4s., r. £80 p.a.	300
Portman Estate—15, Lower Berkeley-st., u.t. 25 yrs., g.r. £37	2,500

By NORTON, TRIST, & GILBERT.

Mile-end—65 and 67, Globe-rd., and 1 to 4, Rose-pl., f., area 4,200 ft., e.r. £170 p.a.	1,480

By BAKER & SONS.

Harlesden, near—Twenty-seven plots of land, f.	1,741
Willesden-green—Twenty-four plots of land, f.	1,762

By HUSSEY, WALCOTT, & BLACKFORD.

Hackney—38 and 40, Tudor-rd., u.t. 34 yrs., g.r. £3. 8s., r. £84 p.a.	400
Wimbledon—14, Spencer-hill, f., r. £80 p.a.	1,205

By E. E. CROUCHER & Co.

Stroud-green—4, Granville-rd., u.t. 89 yrs., g.r. £9, r. £45 p.a.	450
West-green—1, 2, and 10, Leoville-ter., u.t. 86 yrs., g.r. £32. 10s., r. £96 p.a.	900

By R. REID.

Dorset-sq.—60, Upper Gloucester-pl., u.t. 31 yrs., g.r. £15, r. £108 p.a.	900
Regent's-park—14, Park-pl., and 26, Park-st., u.t. 11 yrs, g.r. £7. 7s., £95 p.a.	255
Bayswater—9 and 11, Norfolk-mews, u.t. 54 yrs., g.r. nil, r. £60 p.a.	560
Dorset-sq.—20, Balcombe-st., u.t. 19 yrs., g.r. £30, r. £90 p.a.	360
Balcombe-st.—f.g.r. of £40, term 31 yrs.	610
Blandford-sq.—L.g.r. £85, u.t. 46 yrs., at g.r. of £1 p.a.	1,360
Seven Sisters-rd.—F.g.r. of £30, with reversion in 35 yrs.	1,360
Notting-hill—F.g.r. of £60, with reversion in 53 yrs. to £360 p.a.	1,070

[*Contractions used in this list.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

THURSDAY, JULY 25.

Builders' Benevolent Institution.—Annual Meeting of the Subscribers and Donors, Willis's Rooms, St. James's, 3 p.m.

SATURDAY, JULY 27.

Architectural Association.—Fifth vacation visit to Maidstone and Leeds Castle. (See advt.)

Miscellanea.

The Corinth Canal.—The Royal Commission appointed to report upon the works of the Corinth Canal, which was to have cost thirty million francs, and to have been finished last year, has come to the conclusion that the canal cannot be completed for less than twice that amount, and that the work cannot be finished till the end of 1891. It has been ascertained that ten million cubic feet of earth have still to be removed. All work on the canal is at present at a standstill, owing to the want of funds.

Cement in Japan.—It is very probable that the imports of cement into Japan will soon cease. According to the *Japan Gazette*, a Yokohama dealer in cement has discovered a stone, called *nekura*, in the Noto district, which is stated to possess remarkable qualities as a cement material. It is said that the cement will sustain a weight of 400 lbs. to 500 lbs. per square *sun* (about 1½ in.). Foreign cement is sold in Japan at about 4·70 dols. per barrel, while the estimated sale price of the native cement is about 2·50 dols.

New Concert Hall in New York.—It is stated that a gigantic new concert-hall is to be erected in New York with funds left by the late Mr. Andrew Carnegie, the well-known millionaire. The cost is estimated at about 130,000*l.*, and the grand hall will seat 3,000 persons.

The English Iron Trade.—The English iron market continues firm and in a rising tendency, although the trade doing is not very large, the recent advances having to some extent checked business. Pig-iron is very stiff, the strong tone of the Scotch warrant market being particularly marked, and causing makers in Scotland to improve their quotations by from 1s. to 1s. 6d. a ton. In the North of England the feeling in the pig-iron trade has greatly improved, and No. 3 Cleveland pig cannot now be obtained under 40s. Both in Lancashire and Staffordshire prices of pig-iron are higher, while hematites in the north-west and on the east coast are quoted 6d. a ton more. Finished iron rules very steady at the advanced rates declared at last week's quarterly meetings. The bulk of the trade doing is increasing, while in steel the same amount of activity shows itself as has been observed during the last few weeks. Shipbuilding is still an active and increasing trade. Engineers continue to do well.—*Iron.*

A New Light Fire-Escape.—On Saturday last we witnessed some trials of a new patent fire-escape at the works of the makers, Messrs. E. H. Bayley & Co., Limited, Newington Causeway. The new escape, which reaches to a height of 30 ft., is intended for use by the police and other authorities as a quickly-available and readily-moved auxiliary to the heavier escapes in use by the Fire Brigade. It weighs only 4 cwt., and is thus easily moved and worked by one man. It is devoid of the usual shoot, and is very strong, being built of ash timber, well braced by wire rope. For the purpose indicated, as well as for use in villages and in connexion with large institutions and private mansions remote from fire brigades, it likely to prove of great service.

The Savoy Hotel.—In our description of this structure, in last week's *Builder*, we omitted to mention the arrangements of locks throughout the building, which were supplied by Messrs. Hobbs, Hart, & Co., of Cheapside. These locks are made on the vertical or Continental principle, with the keyhole below, the handles of ebony. The locks of each floor, from the eighth downwards, are made to differ, with a separate sub-master-key for each, opening all the locks on its special floor, but having no connexion with any other floor, and a grand master-key to open the whole of the establishment. This is probably one of the largest suites of locks ever made.

The Howard Estates.—Shortly will be offered for sale at auction, and in several lots, the larger portion of the late Earl of Carlisle's property in the Morpeth and Castle Wards, County Northumberland. The estates to be sold are situated in the parishes of Morpeth, Mitford, Bedlington, Ulgham, and Stannington, and lie between the Rivers Wansbeck and Blyth. They extend over 12,000 acres, including about forty farms, together with the villages of Hepscott, or Leipscott,—1,604 acres, in Morpeth Parish; Netherton, occupied chiefly by pitmen, 1,506 acres, near to Bedlington; Ulgham, and Stannington.

The Essen Works.—The directors of the Essen Works have just issued an interesting little pamphlet respecting their history, from which it appears that in 1833 only nine workmen were employed there, the number having risen to seventy-four in 1848, and last year to 20,960. There are now at the works 1,195 furnaces of various kinds, ninety-two steam-hammers of from 100 to 50,000 kilos weight, and 370 steam-engines of 27,000 horse-power; 2,735 tons of coal and coke are consumed daily, and the diurnal output of iron of all kinds is 600 tons.

Death of an Aberdeen Architect.—Intimation was received at Aberdeen, on the 16th inst., of the death of Mr. J. Russell Mackenzie, architect, who only left the city for South Africa in August last. Previous to leaving the country he was made the recipient of a handsome public testimonial. During his thirty-one years' career in Aberdeen Mr. Mackenzie was the designer of many public buildings, and as a Town Councillor he also rendered good service. —*Scotsman.*

The Sanitary Institute.—At a meeting of the Council of this Institute, held on the 10th inst., Prof. W. H. Corfield, M.A., M.D., in the chair, further arrangements were made for the congress and exhibition to be held at Worcester in September next.

Raffety, Thornton, & Co.—The Directors of Raffety, Thornton, & Co., Limited, have declared an interim dividend at the rate of 7 per cent. per annum free of income-tax.

Sale of an "Adventurer's Share" in the New River Company.—On Wednesday last, at the Mart, Tokenhouse-yard, Messrs. Edwin Fox & Bousfield offered for sale by auction, in one lot, an entire freehold Adventurer's Share in the New River Company. It was stated in the particulars of sale that such a "lot" had never been submitted to public competition since the river was finished. The annual income of the company from land and water is ever increasing, and last year it amounted to 511,356*l.* There is the reversion to considerable estates in Middlesex and Hertford, to various premises in the City, and to the Myddelton-square estate (Clerkenwell) of about 50 acres, which for the most part is covered with buildings, the leases of which will expire in about twenty years. The share offered for sale Wednesday qualifies the possessor for a seat at the Board. In submitting the "lot," Mr. Bousfield stated that the income derived by the share for last year up to Christmas was 2,610*l.* The first bid made was 80,000*l.*, followed by offers of 81,000*l.*, 85,000*l.*, and 90,000*l.*, which was increased, by bids of 1,000*l.* each, to 95,000*l.* The auctioneer then called attention to the growing revenue and the improving prospects of the company, with the increase in the population served, and the reversion to the estates mentioned. Offers were subsequently made up to 122,000*l.*, and eventually the share was disposed of for 122,800*l.*, the purchase being made on behalf of the Prudential Assurance Company.—*Times.*

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	7 0 0	7 15 0
Teak, E.I. ....load	12 0 0	14 0 0
Sequoia, U.S. ....foot cube	0 2 3	0 3 0
Ash, Canada ....load	3 10 0	5 0 0
Birch ,, ...load	3 10 0	6 0 0
Elm ,, ...load	4 0 0	5 0 0
Fir, Dantsic, &c. ....load	2 0 0	3 10 0
Oak ,, ...load	2 10 0	4 10 0
Canada ....load	5 10 0	7 10 0
Pine, Canada red ....load	3 0 0	4 0 0
,, yellow ....load	3 10 0	5 5 0
Lath, Dantsic ....fathom	4 10 0	5 10 0
St. Petersburg ....fathom	5 0 0	6 10 0
Wainscot, Riga, &c. ....log	2 15 0	4 5 0
Deals, Finland, 2nd and 1st ...std. 100	9 0 0	11 0 0
,, ,, 4th and 3rd ....std. 100	7 10 0	8 15 0
Riga ....std. 100	7 0 0	9 0 0
St. Petersburg, 1st yellow ....std. 100	11 0 0	15 0 0
,, 2nd ,, ...std. 100	10 0 0	11 0 0
,, white ....std. 100	7 0 0	10 10 0
Swedish ....std. 100	9 0 0	16 0 0
White Sea ....std. 100	9 10 0	17 0 0
Canada, Pine, 1st ....std. 100	16 0 0	26 0 0
,, ,, 2nd ....std. 100	11 0 0	17 10 0
,, ,, 3rd, &c. ....std. 100	8 0 0	10 10 0
,, Spruce, 1st ....std. 100	9 10 0	11 0 0
,, ,, 3rd and 2nd ....std. 100	7 0 0	9 0 0
New Brunswick, &c. ....std. 100	6 10 0	8 10 0
Battens, all kinds ....std. 100	6 10 0	19 0 0
Flooring Boards, sq., 1 in., prepared, First ....sq.	0 11 0	0 14 6
Second ....sq.	0 8 0	0 10 6
Other qualities ....sq.	0 5 6	0 7 9
Cedar, Cuba ....foot	0 0 4½	0 0 4¾
Honduras, &c. ....foot	0 0 4½	0 0 4¾
Mahogany, Cuba ....foot	0 0 4½	0 0 6½
St. Domingo, cargo average ....foot	0 0 4½	0 0 6½
Mexican ,, ...foot	0 0 4½	0 0 5½
Tobasco ,, ...foot	0 0 5½	0 0 6½
Honduras ,, ...foot	0 0 5½	0 0 6½
Box, Turkey ....ton	6 0 0	15 0 0
Rose, Rio ....ton	15 0 0	30 0 0
Bahia ....ton	14 0 0	18 0 0
Satin, St. Domingo ....foot	0 0 6	0 1 0
Porto Rico ....foot	0 0 9	0 1 3
Walnut, Italian ....foot	0 0 4½	0 0 6½
METALS.		
IRON—Bar, Welsh, in London ...ton	5 5 0	5 10 0
,, ,, at works in Wales ...	4 15 0	5 0 0
,, Staffordshire, in London ...	5 10 0	6 10 0
COPPER—		
British, cake and ingot ....ton	46 0 0	46 10 0
Best selected ....ton	47 0 0	47 10 0
Sheets, strong ....ton	53 10 0	0 0 0
Chili, bars ....ton	41 10 0	0 0 0
YELLOW METAL ....lb.	0 0 5	0 0 5½
LEAD—		
Pig, Spanish ....ton	12 5 0	12 7 6
English, com. brands ....ton	12 10 0	12 12 6
Sheet, English ....ton	13 10 0	14 0 0
SPELTER—		
Silesian, special ....ton	19 2 6	19 7 6
Ordinary brands ....ton	19 0 0	19 2 6
TIN—		
Straits ....ton	89 0 0	0 0 0
Australian ....ton	88 10 0	0 0 0
English Ingots ....ton	93 0 0	0 0 0
ZINC—English sheet ....ton	21 0 0	22 0 0
OILS.		
Linseed ....ton	20 7 6	20 12 6
Cocoanut, Cochin ....ton	26 10 0	27 10 0
Ceylon ....ton	23 10 0	24 0 0
Palm, Lagos ....ton	24 10 0	0 0 0
Rapeseed, English pale ....ton	28 10 0	29 0 0
,, brown ....ton	27 10 0	0 0 0
Cottonseed, refined ....ton	26 0 0	27 10 0
Tallow and Oleine ....ton	21 0 0	40 0 0
Lubricating, U.S. ....gal.	5 0 0	6 0 0
,, refined ....gal.	7 0 0	12 0 0
TAR—Stockholm ....barrel	1 3 6	1 4 0
Archangel ....barrel	0 15 9	0 16 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

ANGLESEY.—For alterations and additions to "Uxbridge House," for Mr. S. T. Blake. Mr. Wm. Yeardye, architect, High-street, Gosport:—
C. J. Lear & Son, Alverstoke (accepted). £500 0 0

BALHAM.—For erecting model dairy. Mr. J. Nixon Horsfield, architect, 20, Market-place, Kingston-on-Thames. Quantities by Mr. F. Thomson, 5, Great James-street, W.C.:—

Bywater & Co.	£2,447 0 0
E. Toms	2,256 0 0
Battley & Co.	2,208 0 0
R. S. Lamble	2,042 0 0
Turtle & Appleton	2,010 0 0
Lordon & Son	1,989 0 0
J. Johnson, Belle Vue-road, Wandsworth-common (accepted)	1,977 0 0
Dickson & Wallis	1,848 0 0

CROYDON.—For alterations and repairs to Richmond and Chandos Villas, for Mr. W. Sharp:—

Maides & Harper	£151 0 0
Ridge & Broughton	127 0 0
Long	111 0 0
Watson	110 0 0
Taylor	101 0 0

CROYDON.—For the erection of mews and cottages, Mayday-road, Croydon. Mr. Henry Gough, architect, Station-road, West Croydon:—

Eldridge, London	£1,530 0 0
Taylor, Croydon	1,150 0 0
Marriage, Croydon	1,100 0 0
Sedgwick, Croydon	1,050 0 0
Saunders, Croydon	1,010 0 0
Smith & Bulled, Croydon	967 10 0
Barker, Croydon	950 0 0
Batley & Linfoot, Croydon	948 0 0

EALING.—For erecting four shops at Ealing Dean, for Mr. J. B. Brown. Mr. J. Hume, architect and surveyor, 15, The Grove, Hammersmith. Quantities supplied by architect:—

T. Parker	£1,120 10 0
C. Green	1,099 0 0
H. Rayner	1,060 0 0
G. Allen & Son, Hackney	1,047 15 0

EASTHAM.—For the erection of a residence for Dr. Beaumont. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C.:—

Reed	£850 0 0
Bishop Bros. & Marston	581 0 0
Lascelles	572 0 0
Hood	553 0 0

EDMONTON.—For the enlargements at Brettenham-road and Crayland-road Schools, for the School Board for Edmonton:—

	Brettenham-road.	Crayland-road.
Humphrys & Son, Tottenham	£1,695	£1,960
W. Gardener, Waltham Abbey	1,650	1,900
Brass & Son, St. Luke's, E.C.	1,599	1,865
C. Wall, Chelsea	1,571	1,865
Messrs. Patman, Enfield	1,529	1,798
J. H. Mollett, Poole-street, Hoxton*	1,420	1,518

* Accepted.

LONDON.—For building casual wards and receiving wards in Bear-yard, Lincoln's Inn-fields, for the Guardians of the Strand Union. Mr. Wm. S. Cross, architect, 18, Outer Temple, Strand. Quantities by Mr. H. E. Pollard:—

	Casual Wards.	Receiving Wards.	Total.
B. Nightingale	£9,313	£5,141	£14,454
Garlick & Horton	9,245	4,995	14,240
J. Clemence	9,250	4,929	14,179
Longley & Co.	9,175	4,975	14,150
Bissett & Sons	9,100	5,000	14,100
Patman & Fotheringham	9,235	4,720	13,955
Laing & Son	8,990	4,950	13,940
Patrick & Son	9,080	4,770	13,850
Hall, Beddall, & Co.	9,169	4,662	13,831
Stephens & Bastow	8,997	4,777	13,774
W. M. Dubbs	8,808	4,661	13,639
Dorrell & Co.	9,116	4,260	13,376
Brass & Son	8,773	4,597	13,370
Chas. Wall	8,449	4,537	12,986
J. O. Richardson	8,430	4,489	12,919

LONDON.—For pulling down and re-erecting the premises Nos. 20 and 21, Bayswater-terrace, W., for Mr. W. Strudwick. Messrs. Edmeston & Gabriel, 42, Old Broad-street, E.C., architects:—

W. Brass & Son	£4,614 0 0
W. Hearn & Co.	4,570 0 0
Thos. Boyce	4,514 0 0
R. Lawrence & Sons	4,438 0 0
John Allen & Sons	4,394 0 0
Jas. Smith & Sons	4,387 0 0
William Shurmur	4,320 0 0
Killby & Gayford	4,219 0 0
Chas. Kyncoh & Co. (accepted)	4,128 0 0

LONDON.—For alterations and fittings, 12 and 14, Catherine-street, for the Hansard Publishing Union (Limited). Messrs. Mackmurdo & Horne, architects:—

W. Vanstone	£2,465 0 0
Monk	2,450 0 0
Colls	2,400 0 0
Hampton	2,037 0 0

LONDON.—For the erection of a school to provide accommodation for 800 children on the site in Merton-road, Wandsworth, for the School Board for London. Mr. T. J. Bailey, architect:—

S. Barton & Co.	£12,896 0 0
J. Shillitoe & Son	12,428 0 0
D. Charteris	11,763 0 0
W. H. Lorden & Son	11,709 0 0
Kirk & Randall	11,633 0 0
J. Longley & Co.	11,355 0 0
Hugh Knight*	11,064 0 0
J. Holloway	11,000 0 0

* Recommended by the Works Committee for acceptance

COMPETITION, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITION.

Nature of Work.	By whom Required.	Premium.	Designs to be delivered.	Page.
Town Hall	Cromer Town Hall Co. Ld.	Not stated	Aug. 17th	i.

CONTRACTS.

Nature of Work, or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Building Nurses' Rooms, &c.	Whitechapel Union	B. J. Capell	July 23rd	x.
Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.	x.
York Paving, or Victoria or other Stone	Mile End Old Town Vestry	J. N. Knight	July 24th	x.
Constructing Sewer	St. Mary Abbotts Ves. (Kensington)	*Official*	do.	x.
Trench Puddle Trench	Thirsk Water Co.	A. E. Preston	do.	x.
Worksheds	Wandsworth and Clapham Union	T. W. Aldwinckle	July 25th	ii.
Stoneware Drain Pipes	Brighton Town Council	G. R. Andrews, C.E.	July 26th	ii.
Erection of Schools	St. Athanasius School Committee	Duckworth & Metcalf	do.	x.
Sundry Alterations	London County Council	*Official*	July 29th	ii.
Boundary Wall and Fence	do.	do.	July 30th	ii.
Boiler, Steam Engine, Water Tanks, &c.	Strand Union	W. S. Cross	do.	x.
Lodge, &c.	London County Council	*Official*	Aug. 1st	ii.
Waterworks	Faringdon Union R.S.A.	F. H. Barfield, F.S.I.	Aug. 2nd	ii.
Broken Granite	Brentford Local Board	J. H. Strachan	Aug. 6th	x.
Levelling, Paving, Kerbing Roads, &c.	Southend Local Board	P. Dodd	do.	x.
Machinery	Richmond Main Sewerage Board	J. C. Mellis	Sept. 4th	ii.
External Painting, Tarring, &c., Chichester	War Department	*Official*	Not stated.	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Temporary Clerk of Works	Royal Engin., Sheerness	10s. per diem	Not stated.	xvi.
Temporary Foreman of Works	do.	6s. ,,	do.	xvi.
Quantity Surveyor	Huddersfield Corp.	Not stated	do.	xvi.

LONDON.—For the enlargement of the Rockingham-street School, Newington-causeway, by 600 places, for the School Board for London. Mr. T. J. Bailey, architect:—

G. S. S. Williams & Son	£3,745 0 0
D. Charteris	3,640 0 0
Wm. Downs	3,640 0 0
W. L. Kellaway	3,534 0 0
Geo. Parker	3,485 0 0
A. & W. Garnar*	3,330 0 0

* Recommended by the Works' Committee for acceptance.

LONDON.—For the erection of a junior mixed school, to provide accommodation for 420 children, on the "Latchmere" site, Battersea Park-road, for the School Board for London. Mr. T. J. Bailey, architect:—

S. Barton & Co.	£6,686 0 0
J. Longley & Co.	6,664 0 0
D. Charteris	6,328 0 0
W. Lorden & Son	6,021 0 0
J. Holloway*	5,650 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For the enlargement of Gainsborough-road school, Hackney, by 600 places, for the School Board for London. Mr. T. J. Bailey, architect:—

G. S. S. Williams & Son	£9,639 0 0
Wm. Downs	9,596 0 0
Killby & Gayford	9,538 0 0
Chas. Cox*	9,397 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For enclosing, levelling, draining, and tarpaving the additional land adjoining the Manchester-street School, Gray's Inn-road, for the School Board for London. Mr. J. T. Bailey, architect:—

Norris & Luke*	£586 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For providing and fixing hot-water apparatus throughout the whole of the Crampton-street School, Newington, for the School Board for London. Mr. T. J. Bailey, architect:—

J. & F. May	£1,050 0 0
Killich & Cochran	725 0 0
J. Grundy	665 0 0
R. P. de Ridder	600 0 0
Comyn, Ching, & Co.*	549 15 0
Musgrave & Co.	530 0 0
J. Jackson	473 0 0
T. Dowd	435 0 0
J. L. Bacon & Co.	386 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For extending the boys' staircase, Rendlesham-road, Hackney, for the School Board for London. Mr. T. J. Bailey, architect:—

E. A. Roome	£133 0 0
Norris & Luke*	104 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of five shops, Old Kent-road, for Mr. W. J. Huxley. Mr. E. E. Niblett, architect, 192, Hackney-road:—

Anley	£2,360 0 0
Wilkinson Bros.	2,325 0 0
J. Walker	2,220 0 0
Spencer & Co.	2,140 0 0
Vears & Co.	1,900 0 0
Veale (accepted)	1,875 0 0

LONDON.—For erecting warehouse at No. 51, High-street, St. Giles's, Bloomsbury, for Mr. Joseph Muskett Yetts. Mr. W. M. Yetts, architect:—

Rowlandson	£1,110 0 0
W. Gladding	789 0 0
Maley	737 0 0
S. W. Hawkings	631 0 0

LONDON.—For pulling down houses on the Tilliard Estate, Norton Folgate, E.C., and building five houses and shops. Messrs. Farebrother, Ellis, & Clark, surveyors:—

C. Kynoch & Co.	£6,413 0 0
Lawrence & Son	6,333 0 0
Smith & Son	6,187 0 0
Killby & Gayford	5,936 0 0
S. J. Scott	5,581 0 0

LONDON.—For alterations and additions to the Hampstead Branch of the London and South-Western Bank, Limited, for the Directors. Mr. Edward Gabriel, architect, 42, Old Broad-street, E.C.:—

W. H. Watts	£3,469 0 0
B. E. Nightingale	3,386 0 0
Gould & Brand	3,243 0 0
Jas. Smith & Sons	3,193 0 0
Chas. Kynoch & Co. (accepted)	2,970 0 0

LONDON.—For sundry additions, alterations, and decorations at 11, Upper Berkeley-street, W. Messrs. New & Son, architects:—

Byers	£843 3 8
Oldrey & Co.	734 0 0
Tenant & Co.	696 0 0
Edw. Harris & Sons	696 0 0
Mark	663 0 0

LONDON.—For alterations and additions to the "Primrose" Tavern, 53, Oxford-street, for Mr. J. G. Newton. Mr. E. E. Niblett, architect, 192, Hackney-road:—

Thompson	£159 10 0
Vears & Co.	155 10 0
Veale (accepted)	150 10 0

LONDON.—For the supply of materials to the Vestry of Chelsea:—

For the supply of 780,000 3 in. by 9 in. by 5 in. Yellow Deal Blocks, at per Thousand.

Powis & Wedlake	£6 5 0
Farquharson Bros.	6 2 6
Skelton & Co.	5 17 6
Knight	5 14 6

Burt, Boulton, & Haywood informal.

For the supply of 572 Tons Best Portland Cement to specified test, at per Ton.

	s. d.
Lavers	30 0
West Bros.	29 9
Skelton & Co.	29 9
J. Williams	29 6
Wakeley Bros.	28 10
Eastwood & Co.	28 0

For Ballast and Sand.

	Total.
J. Neal	£587 10 0
Skelton & Co.	484 11 8
Covington	483 0 10

LONDON.—For the erection of six houses upon the Petley Estate. Messrs. W. Reddall & Son, architects and surveyors, 10, South-street, Finsbury, E.C. Quantities not supplied:—

Lascelles	£2,280 0 0
Wire	1,758 0 0
Elkington	1,430 15 0
Coldwells	1,250 0 0

LONDON.—For addition to offices, Dockhead, Bermondsey, for Messrs. Chas. Southwell & Co. Mr. Lawton R. Ford, architect, 24, Railway Approach, London Bridge, S.E.:—

A. White & Co.	£563 0 0
J. Ballers (accepted)	495 0 0
S. Kipps (withdrawn)	475 0 0

LONDON.—For erecting and completely finishing the George Works, Chequer-alley, E.C., for Messrs. J. De la Rue & Co. Messrs. Parr & Sons, architects:—

M. Patrick	£14,498 0 0
Burge	14,400 0 0
Colls & Son	12,940 0 0
Ashby & Horner	12,500 0 0
Woodward	12,270 0 0
Lascelles & Co.	12,250 0 0
Simpson & Son	12,098 0 0
Brass & Son	12,773 0 0
C. Kynoch & Co.	12,595 0 0

LONDON.—For the erection of a Police-station, Wick-road, Victoria-park, for the Commissioners of Police:—

J. Morter	£4,497 0 0
Avis	4,270 0 0
J. Chappell & Co.	4,182 0 0
E. Lawrence & Son	4,128 0 0
W. Brass & Son	4,100 0 0
W. Shurmur	4,077 0 0
J. Grover & Son	3,990 0 0
W. Lorden	3,947 0 0
Perkins	3,980 0 0
Hart	3,973 0 0
Ansell	3,950 0 0
Scrivener & Co.	3,897 0 0
Lathey Bros.	3,870 0 0

LONDON.—For additions and alterations to premises, Campden-street, Kensington, for Mr. R. Maunder. Mr. J. Hume, architect and surveyor, 15, The Grove, Hammersmith:—

C. Rogers	£347 15 0
H. King, Kensington	233 10 0

LONDON.—For building organ factory for Mr. A. Mont, 550, Holloway-road:—

Lockwood & Co., Walworth	£1,550 0 0
Edwards	1,400 0 0
Beaves Bros., Kentish Town	1,352 0 0
Mollett	995 0 0
Hughes, Stroud Green	985 0 0
Norris & Luke	900 0 0
T. Channing	845 0 0
McKewin	835 10 0
J. Roberts, Stratford	835 0 0
A. Nichols, Leytonstone	825 0 0
Marriott, High Barnet	791 0 0
A. & W. Garnar, Peckham	717 0 0

LONDON.—For alterations to the "Star and Garter" public-house, Caledonian-road, N. Messrs. Wilson, Son, & Aldwinckle, architects:—

E. Toms	£2,494 0 0
W. Shurmur	2,268 0 0
Ashby & Horner	2,192 0 0
Hearle & Son	2,190 0 0
J. Mills & Co.	2,100 0 0

LONDON.—For alterations, &c., to the "Duke of York," Clerkenwell-road, E.C., for Messrs. George Sansom & Sons. Mr. H. I. Newton, architect, 40, Victoria-street, Westminster, S.W.:—

S. E. Lamble, Kentish Town	£631 0 0
H. Burman & Sons, Kennington Park	630 0 0
S. Godden, Bryanston-square	535 0 0
W. L. Kellaway, Clerkenwell*	493 0 0

* Accepted.

LONDON.—For about 570 ft. of pipe sewer, Seagrave-road, for the Vestry of the Parish of Fulham. Mr. James P. Norrington, Surveyor:—

Rogers & Co., Notting-hill	£407 0 0
Morris, Twickenham	273 0 0
Adams, Kingsland	261 0 0
Mears, South Kensington	255 0 0
Tomes & Wimper, Hammersmith	232 0 0
Marriott, High Barnet	230 0 0
Nowell & Robson, Kensington	217 0 0

LONDON.—For superintendent's residence, South-Eastern Ambulance Station, Old Kent-road, for the Metropolitan Asylums Board. Mr. Thomas W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C.:—

		Allow for old material.
H. Toten & Sons, 161, Gloucester-road, South Kensington	£830 0 0	£30 0 0
H. L. Holloway, 160, Queen's-road, New Cross Gate	760 0 0	Nil.
Thomas Hooper, 59 and 61, Wandsworth-road	784 16 10	45 12 6
William Johnson, Wandsworth Common	730 0 0	65 0 0
Harry Bacon, 58, Queen's-road, West Croydon	728 13 0	63 10 0
Edward Hughes, 91, Lancaster-road, Stroud Green	605 0 0	40 0 0
John Mills, Broadwall, Stamford-street, S.E.	709 0 0	80 0 0
A. & W. Garnar, 36, Frankton-road, Hill-street, Peckham	600 0 0	35 0 0

LONDON.—For alterations to gates and re-setting piers, at the Blackstock entrance to Finsbury-park, for the London County Council. Mr. Thomas Blashill, Architect. Quantities not supplied:—

F. Blandford, Highbury	£307 0 0
C. Killingback, James street, Camden-town	260 0 0
Faulkner,* Walton-on-Thames	206 0 0

* Accepted.

NEWCASTLE-ON-TYNE.—For additions to the Northern Assurance Company's premises, Newcastle-on-Tyne. Mr. Henry S. Legg, architect, Christ's Hospital, London:—

Middlemiss, Newcastle	£7,383 0 0
Bew, Newcastle	6,935 9 9
Lowry, Newcastle	6,760 0 0
Walter Scott, Newcastle	6,617 8 10

PUTNEY.—For erecting house and shop in Lower Richmond-road, for Mr. G. F. Garner. Mr. J. Hume, architect and surveyor, 15, The Grove, Hammersmith:—

Lucas & Wiseman	£437 0 0
C. Green	410 15 0
H. Williams	400 0 0
W. Wheeler, Wandsworth	397 10 0

SEVENOAKS.—For levelling, metalling, channelling, storm-water drains with manhole, gullies, &c., to Bethnal-road, Sevenoaks, for the Sevenoaks Local Board. Mr. Jabez Mann, Town Surveyor :—

Thomas Adams, London	£381	4	3
Alfred Palmer, Bromley	373	5	8
Woodhams & Fry, Greenwich	361	5	2
William Coker, Halling	350	6	6
Marriott & Co., High Barnet	314	0	6
Thomas Fishenden, Sevenoaks	295	9	8
J. Bedwell, London	291	18	2
Mid Kent Building and Contracting Works, Limited, Beckenham	289	0	0
Sidney Hudson, London	279	0	0
R. B. Chittenden, Offham*	260	2	11
Surveyor's Estimate	271	5	0

* Accepted according to Schedule of prices.

STUBBINGTON.—For the erection of water tower, servants' hall, &c., at Stubbington House, for Mr. M. H. Foster, C.C. Mr. W. Yeardye, architect, High-street, Gosport. Quantities supplied :—

W. Hill & Co., Gosport	£1,461	0	0
E. Tutte, Fareham	1,438	10	0
T. P. Hall, Southsea	1,353	0	0
F. G. White & Sons, Landport	1,345	0	0
C. Wareham, Stubbington	1,308	0	0
H. Jones, Southsea	1,295	0	0
J. Crockerell, Landport	1,248	10	0
W. Rapley, Forton	1,213	15	6½
J. Plummer, Fareham (accepted)	1,210	0	0
G. Beech, Southsea	1,188	0	0

STUBBINGTON.—For the erection of a pair of cottages, for Mr. M. H. Foster, C.C. Mr. Wm. Yeardye, architect, Gosport. Quantities supplied :—

C. Wareham, Stubbington (accepted)	£600	0	0

TOTTENHAM.—For alterations, bar-fittings, pewtering, and other work, at the "Bull" Inn, High-road, Tottenham, for Mr. S. Perrin. Mr. G. L. Wilson, architect. Quantities not supplied :—

F. Blandford (accepted)	£361	0	0

[No competition.]

UXBRIDGE.—For alterations and additions to St. John's Schools, Uxbridge Moor. Messrs. George & W. Byes, architects, Uxbridge :—

Kearley, Uxbridge	£613	0	0
Passmidge & Son, Uxbridge	594	0	0
Hardy, Cowley	589	0	0
A. & B. Hanson, Southall	569	12	6
Brown & Son, Harefield	509	0	0

VIRGINIA WATER.—For erecting new homestead at Trumps Farm, near Virginia Water. Messrs. Castle, Field, & Castle, architects, 18, Merton-street, Oxford :—

G. Reavell, Staines	£1,275	0	0
Knight & Sons, Chertsey	1,222	0	0
Wilkins & Son, Oxford	1,098	0	0
G. Gray, Egham	1,097	0	0
W. Musselwhite, Basingstoke	998	0	0

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